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AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES APPROPRIATIONS FOR 2001

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES

JOE SKEEN, New Mexico, *Chairman*

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JAY DICKEY, Arkansas
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HENRY BONILLA, Texas
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NOTE: Under Committee Rules, Mr. Young, as Chairman of the Full Committee, and Mr. Obey, as Ranking Minority Member of the Full Committee, are authorized to sit as Members of all Subcommittees.

HENRY E. MOORE, JOHN J. ZIOLKOWSKI, MARTIN P. DELGADO, and JOANNE L. ORNDORFF, *Staff Assistants*

PART 4

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AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION, AND RELATED AGENCIES APPROPRIATIONS FOR 2001

WEDNESDAY, MARCH 8, 2000.

DEPARTMENT OF AGRICULTURE

WITNESSES

I. MILEY GONZALEZ, UNDER SECRETARY, RESEARCH, EDUCATION, AND ECONOMICS
FLOYD P. HORN, ADMINISTRATOR, AGRICULTURAL RESEARCH SERVICE
SUSAN E. OFFUTT, ADMINISTRATOR, ECONOMIC RESEARCH SERVICE
CHARLES W. LAUGHLIN, ADMINISTRATOR, COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE
R. RONALD BOSECKER, ADMINISTRATOR, NATIONAL AGRICULTURAL STATISTICS SERVICE
STEPHEN B. DEWHURST, BUDGET OFFICER

Mr. SKEEN. The subcommittee will come to order. Good morning.

Dr. GONZALEZ. Good morning.

Mr. SKEEN. Today we have with us the good folks who manage the USDA's research, education, and economic programs, and we are always delighted to have you here because you bring these shopping bags. But you have got one thing that bothers me in there, the one that looks like it is dynamite. They tell me they are beef strips. Those have exploded. [Laughter.]

Mr. SKEEN. This year we have provided nearly $2 billion for these programs, which is evidence of strong bipartisan support that you have from this committee. I have said many times that research is really the foundation of the best agricultural system in the world, allowing a very few farmers and ranchers to feed 270 million Americans and many more people overseas. It also enables us to compete successfully with much lower costs to producers than in other countries.

I say this because in the draft supplemental legislation we have put a limitation on the mandatory research program. We have done this every year, and as we do with other mandatory programs, simply to get savings to meet all the other requests that we have for spending.

Every year in our supplemental we are instructed to identify one or two items that at least partially offset the cost of the supplemental, and this year we have identified the mandatory research and the Fund for Rural America.

I mention this only because I don't want anyone to interpret this as a sign of opposition to research, because it isn't. It has been the mainstay of providing good agricultural produce in this country.

At any rate, that is the fiscal year 2000 supplemental issue and we will discuss it separately. We are here today to discuss the fiscal year 2001 budget. And with us we have Dr. I. Miley—otherwise known as "Smiley"—Gonzalez, the Under Secretary of Research, Education, and Economics. But before I ask Dr. Gonzalez for his testimony, I would like to ask Miss Kaptur if she has any opening remarks.

Miss KAPTUR. Thank you, Mr. Chairman. Unfortunately, we have a competing hearing with Secretary Cuomo on the VA-HUD Subcommittee, so I am going to be doing musical chairs this morning, and I want to apologize to the Under Secretary and to members of the committee, and I will have to ask some of my colleagues to help pinch-hit for me here. But I wanted to say for the record, Dr. Gonzalez, how impressed I have been with your work and with your deep concern, not just for research as pure research, but also as dissemination, our youth, various humanitarian and development activities that actually occur under your purview there at USDA, and your special efforts to try to help our 1890s colleges. I know we have talked about that, and just, in general, the breadth of interests that you have and your tremendous ability to operationalize those ideas, which isn't always the case with many people who come here and talk to us theoretically about how some things might happen. You actually make them happen, and I just want to welcome you to the committee. And this area of ARS and research and education is just so important to the future of agriculture and the ecosystem in our country and the world. You have the major responsibility there.

I just have to say also for the record, Mr. Chairman, this Under Secretary actually went over to the Smithsonian and has taken a look at the agricultural exhibit, the pitiful agricultural exhibit over there. And I hope some day this committee can hold a hearing over there so that people can really get a sense of what we tell the world about agriculture through the Smithsonian and what we don't. And I want to thank you personally for making that effort.

Dr. GONZALEZ. Thank you.

Ms. KAPTUR. I know that it will result in positive change in the years ahead, so we look forward to your testimony. Thank you very much.

Mr. SKEEN. Doesn't she put that in nice terms?

Dr. GONZALEZ. It is great.

Mr. SKEEN. We are going to do this as long as you are smiling. [Laughter.]

Dr. GONZALEZ. We are going to do this.

INTRODUCTION OF WITNESSES

Mr. SKEEN. Before we proceed, I would like to recognize for the first time as a witness before our subcommittee Ronald Bosecker, who is the new Administrator for the National Agricultural Statistics Service, and Charles Laughlin, the new Administrator for the Cooperative State Research, Education, and Extension Service, and

we welcome you, gentlemen. We wish you the best in your new positions and we look forward to working with you.

Now at this time we would like to have your opening statement. Miley, you are a great friend. Good to see you here. Are you going to do this in English or Spanish?

[Spanish.]

Dr. GONZALEZ. Either way.

[Spanish.]

Mr. SKEEN. Bueno.

Dr. GONZALEZ. I think we will do it in English because my notes are written that way. [Laughter.]

OPENING STATEMENT

Dr. GONZALEZ. It is a delight to be back and to visit with this committee and provide our testimony for the fiscal year 2001 budget recommendations, and also joining us today, in addition to the two Administrators that you have introduced, Dr. Floyd Horn, our Administrator for ARS, and Dr. Susan Offutt, our Administrator for ERS. So they are also with me. And joining me at the table is Mr. Steve Dewhurst from our office of OBPA at USDA, and I am sure you know Steve, since he has been up here many times.

Mr. SKEEN. A lot longer than I have been up here, I can tell you that. It is always nice to see his face because you know he's a real gentleman who knows his business. Look at him blush.

Dr. GONZALEZ. Yes, indeed. Yes, indeed.

Mr. SKEEN. We appreciate you.

Dr. GONZALEZ. As a follow-up to that, each of our Administrators has submitted written testimony for the record, and I have provided some lengthy material that I am not going to read. I am going to just go through it and highlight a few of the examples of the work that we have done at USDA and with our partners across the country that highlight the things that you were talking about in your opening statement and that I think underscore the importance of the research, education, and economics mission area activities for, not only USDA, but for our citizens across the country. So I do want to spend a few minutes to do those highlights.

The REE budget that we are discussing reflects strong continued support for the REE programs and a recognition of the contributions that research, education, and economics, statistics and extension programs make in solving the newly emerging and continuing pressing challenges facing agriculture and the Nation. We appreciate the strong support received from Congress in our appropriations for fiscal year 2000. The President's fiscal year 2001 budget provides $2.2 billion for the four REE agencies, an increase in program level of about 3 percent above fiscal year 2000 for the conduct of research, education, economics, extension, and statistical programs. Increases are requested for all four agencies in top priority programs.

The REE mission area agencies have a proud history over many decades of finding solutions to the challenges confronting farmers and ranchers and others involved in agriculture, resulting in a high return on the Federal investment for our Nation, a Nation that enjoys a plentiful, affordable, and safe food supply. This remarkable history of success continues today.

RESEARCH SUCCESS STORIES

I would like to share just a few of the extraordinary number of the recent successes that we have had. As you indicated, the products that are in those bags that you have are examples of some of the results of our research success.

Fruit growers will benefit from an improved biological control agent for fire blight, a bacterial disease of apples and pears which causes serious production losses each year.

New soy-based inks will provide more environmentally friendly inks and open new markets for producers of vegetable oils.

Many farmers will potentially benefit from a new corn germplasm line that resists formation of aflatoxin, a carcinogenic toxin caused by fungus that can accumulate in infected corn, peanuts, and may other oilseed products.

All of the Nation will potentially benefit from improved water and air quality made possible through producer adoption of newly developed methods for using cover crops that eliminates the use of some pesticides without reducing productivity.

Research suggests that nutritional deficiencies in infants have a major impact on cognition and brain function, leading to deficient academic skills, such as reading and arithmetic.

Farmers will benefit from a new comprehensive publication describing risk management tools and strategies at the farm level.

Trade negotiations representing national interests and those of farmers can now use a new classification scheme for assessing the economic impacts of trade barriers, such as sanitary and phytosanitary measures.

Users of statistics on cattle will benefit from the first-ever combined U.S. and Canadian cattle publication providing information for both countries.

As we take great satisfaction in the REE agencies' tremendous success and the extraordinary possibilities of today's cutting-edge research and technology, we must acknowledge that new times demand new emphasis on our programs and new ways of doing business. I would like to take this opportunity to discuss just a few of these new developments and how we are responding to them.

GLOBALIZATION OF AGRICULTURE

In a very real sense, the domestic agenda is a global one. Everything happening domestically has global ramifications. This is just as true for agriculture as for any other area of our national life. The 21st century has brought globalization to all aspects of the food and fiber system, from competitive markets around the world to diseases that know no national boundaries, to collaborative research among nations to solve common problems.

The REE agenda increasingly reflects that fact. The agencies are actively working with scientists and research institutions around the world, as well as collecting statistics and conducting analyses that look at U.S. agriculture as part of a world system. This budget includes a new initiative that is responsive to this new reality and builds on the current international activities already carried out by REE agencies.

CONSUMER-DRIVEN AGRICULTURE

A second trend that the REE programs are increasingly responding to is the growing influence of consumers and their need for confidence in the science on which government policy and regulatory decisions are made. We have become a consumer-driven society, a fact that directly affects agriculture and, therefore, the programs in USDA, particularly in the areas of food safety and the environment. Consumers and producers are demanding confidence in the science supporting such decisions.

Part of this effort involves growing integration of research, education, and extension components of the REE programs, facilitating greater linkage between what scientists are examining and discovering and what consumers need and want to learn.

THE FUTURE SCIENTIFIC AND PROFESSIONAL WORKFORCE

The third emphasis relates to the future scientific and professional workforce for agriculture, food, and natural resource systems. If U.S. agriculture is to keep its global leadership role and competitive position in the 21st century, it must have an appropriately trained, technical and scientific workforce. And given the multi-year educational training required, investments must be made now so that the country does not experience shortages in the future. The budget proposes a significant increase in several programs in response to this critical issue for the future of agriculture in our country.

REE COLLABORATION ACROSS THE GOVERNMENT

A fourth issue relates to how we do business with other departments across the Federal Government and out in the States. We know that many of the problems that our agencies address are complex and can benefit from partnering with other departments that bring different perspectives and capabilities to issues of common interest and concern. We are making every effort to collaborate with partners such as NASA, EPA, Energy, NIH, Labor, and the National Science Foundation.

In our association with these departments and with the Office of Science and Technology Policy, we are working hard to create an understanding in the broader research community that research carried out in or supported by USDA is an important component of the government-wide research and technology agenda. In this context, it is important to emphasize that cutting-edge research is carried out in ARS labs and in similar labs at universities and other non-profit research institutions supported through CSREES programs.

ERS's analysis and NASS's statistical programs make critical contributions to policy, trade, and regulatory decisions. The more the USDA research and development, analysis, and statistics programs are integrated in the Federal R&D effort, the stronger both the U.S. and broader Federal programs will become.

Before turning to the budgets of the agencies, I would like to just highlight the six priority areas that we have identified.

GLOBALIZATION OF AGRICULTURAL RESEARCH, EDUCATION, ECONOMICS AND EXTENSION

In response to the globalization of agriculture, the budget proposes a new initiative of $1.5 million to facilitate the globalization of agricultural research, education, economics, and extension. While the level of funds for this particular initiative is modest, the magnitude of the opportunities it provides to the ultimate benefit of American farmers and ranchers is tremendous. All four REE agencies currently are engaged in some international activities.

These funds would support international activities focused on issues specifically of interest to domestic agriculture. The initiative will facilitate globalization of the agricultural programs in land grant and non-land grant universities and colleges and will support research on issues of importance to all of the country.

A grants program that will provide funds to bring more international involvement to the universities' and colleges' agricultural programs, including the curriculum research agenda, teaching and research experience, is contemplated.

SCIENTISTS AND PROFESSIONALS OF THE FUTURE

The second initiative focuses on the next generation of scientists and professionals, and I discussed that with you a few minutes ago, and the initiative asks for a $5.9 million increase for that category. I think of significance is that we are targeting our ability to address the needs of our minority community and institutions, helping to increase the funding for our programs for Native Americans, Hispanic Americans, and others that have been a part of that agenda.

FOOD QUALITY AND PROTECTION ACT

The public's increasing concern about the quality of the environment and safety of our food reflected in such laws as FQPA is a fact of life. While generally sharing the overall goals, producers find themselves in need of new pest control technologies that are effective and economically viable, while being responsive to public environmental and food safety concerns, and specifically meeting FQPA requirements. Under the umbrella of FQPA, the REE agencies' budgets include an increase of $25.4 million for ARS, CSREES, and NASS.

Both the ARS and CSREES budgets include funding requests to expand work for producers to test new technologies and practices and facilitate their adoption. These increases to promote adoption of these technologies are critical, and we ask for your support in this particular area.

FOOD SAFETY

The REE component of the Food Safety Initiative in the fiscal year 2001 budget provides an increase to ARS and CSREES totaling $14 million, and that includes increased funding through the National Research Initiative.

AGRICULTURAL GENOMICS

The fifth initiative is in the area of agricultural genomics, and you will see in my testimony that we have gone through and identified a number of areas where the leadership of USDA is critical to the process. We are the leader in the President's Food Genome Initiative, and we have had great success at this point. Our request is for an increase of $14.8 million in the fiscal year 2001 budget—an increase over the fiscal year 2000 level.

AGRICULTURAL RESEARCH SERVICE

I would like to turn just briefly to the budget request that you have before you for each REE agency. For ARS in the fiscal year 2001, budget the request is $894 million in ongoing research and information programs, a net increase of $64 million or 7.7 percent over our fiscal year 2000. To partially offset these increases, the budget also includes redirection of approximately $42 million in current programs to fund higher priority programs and initiatives of nationwide interest.

There are a number of details about the additional request within the ARS budget, and I will go back and review those as we get into the questions and answers.

The fiscal year 2001 does propose $39.3 million for buildings and facilities budget, of which $9 million is designated to plan and modernize our ARS and APHIS facilities in Ames.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

The President's fiscal year 2001 budget provides $1.096 billion for CSREES. This includes $973 million in the discretionary budget, an increase of $22 million over fiscal year 2000. You have already discussed the other budget considerations that we will talk about at a later time.

In providing critical funding to the research, education, and extension programs of the land grant system and other universities and organizations across the country, CSREES continues to play a central role in helping generate new knowledge and technology and in facilitating the transfer of that knowledge and technology to farmers and ranchers and others who will use it.

ECONOMIC RESEARCH SERVICE

The Economic Research Service's budget reflects a decrease of $10 million from $65 million in fiscal year 2000 to $55 million in the fiscal year 2001. ERS conducts research and analysis on the efficiency, efficacy, and equity aspects of issues related to agriculture, food safety and nutrition, the environment, and rural development. The net decreased funding level is due to the return of $12.2 million for food program studies to the Food and Nutrition Service, and is partially offset by increases of $2.2 million to support new or enhanced research. And under this new and enhanced area, the budget includes $1 million to conduct a close examination of the structural changes in the agricultural and food sectors. ERS would focus on determining where concentration is occurring, who is affected and how, exploring and developing opportunities for farmers with this kind of market environment, and examining ways in

which USDA and other parts of the Government can assist our farmers in adjusting to this structural change.

NATIONAL AGRICULTURAL STATISTICS SERVICE

The NASS budget request shows an increase of $1.3 million over the 2000 budget, a total of $100.6 million due to three important initiatives. One of those is to expand the NASS Hogs and Pigs report to a monthly basis in keeping with the swine-reporting provisions of the fiscal year 2000 agricultural appropriations bill; a request for $800,000 to expand pesticide use surveys in order to promote science-based decisions regarding pesticides; and $1.4 million to upgrade and safeguard computer systems security so that NASS can ensure its pledge of data confidentiality to farmers, ranchers, and agribusinesses, and to guarantee no premature access to data in the market-sensitive areas that we report on.

In summary, Mr. Chairman and members of the committee, I want to reiterate that the REE agencies' budgets reflect a strong commitment to investment in agricultural research, economics, statistics, education, and extension. It also reflects an understanding that research and education are critical for solving not only the problems that agriculture and its producers are facing today, but emerging problems and opportunities for the 21st century. With this continued strong investment, we will be ready to meet those future problems and take advantage of new opportunities presented by cutting-edge science.

I thank you, Mr. Chairman, and would welcome any comments or questions that the committee may have.

[The prepared statements and biographies of Dr. I. Miley Gonzalez, Dr. Floyd P. Horn, Dr. Charles W. Laughlin, Dr. Susan E. Offutt and Mr. Raymond R. Bosecker follow:]

RESEARCH, EDUCATION, AND ECONOMICS

Statement of

Dr. I. Miley Gonzalez, Under Secretary

For the House Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies

Mr. Chairman, Members of the Committee, it is my pleasure to once again appear before you to discuss the FY 2001 budgets for the Research, Education, and Economics (REE) mission area agencies. I am accompanied by the Administrators of the four mission area agencies: Dr. Floyd Horn, Administrator of the Agricultural Research Service (ARS); Dr. Charles Laughlin, Administrator of the Cooperative State Research, Education, and Extension Service (CSREES); Dr. Susan Offutt, Administrator of the Economic Research Service (ERS); Mr. Ronald Bosecker, Administrator of the National Agricultural Statistics Service (NASS). Each Administrator has submitted written testimony for the record.

Given the tight budget constraints of today, the REE budget that we are discussing reflects strong continued support for the REE programs and a recognition of the contributions that research, education, economics and statistics programs of REE make in solving the newly emerging and continuing pressing challenges facing agriculture and the nation. We appreciate the support received from Congress in our appropriations for FY 2000. The President's FY 2001 budget provides $2.2 billion for the four REE agencies, an increase in program level of 3 percent above FY 2000 for the conduct of research, education, economics and statistical programs. Increases are requested for all four agencies in top priority program areas.

REE and its agencies have a proud history over many decades of finding solutions to the challenges confronting farmers and ranchers and others involved in agriculture, resulting in a high return on the Federal investment to our nation that enjoys a plentiful, affordable, and safe food supply. This remarkable history of success continues today, yielding new knowledge, technologies, statistics, and analysis for effectively addressing a vast array of today's problems and building the scientific and technological foundations for addressing tomorrow's problems and opportunities for our agriculture and food system and the farmers, ranchers, food processors and distributors and consumers who are part of that system. A few of the prodigious number of recent successes includes:

- Dairy farmers will soon be able to benefit from a new and faster test for detection of Johne's disease, a chronic infectious and contagious bacterial disease of ruminants.
- Fruit growers will benefit from an improved biological control agent for fire blight, a bacterial disease of apples and pears, causing serious production losses each year.
- New soy-based inks will provide more environmentally friendly inks and open new markets for producers of vegetable oils, benefitting both farmers and the nation.
- Many farmers will potentially benefit from a new corn germplasm line that resists formation of aflatoxin, a carcinogenic toxin caused by a fungus that can accumulate in infected corn, peanuts, and many other oilseed crops.
- All the nation will potentially benefit from improved water and air quality made possible through producer adoption of a newly developed method for using cover crops that eliminates the use of some pesticides without reducing productivity.

- Cattle producers in Georgia are benefitting from a new intensive Extension education program encouraging farmers to more actively market their product and become aware of marketing alternatives.
- Poultry producers and consumers will benefit from a new method for sampling the air in poultry houses and running rapid diagnosis tests for specific food borne pathogens in entire poultry houses, providing a preventative strategy at the hatchery and breeder flock stage rather than requiring use of a trace-back response after a documented outbreak.
- Research suggests that nutrition deficiencies in infants have a major impact on cognition and brain function, leading to deficient academic skills, such as IQ, reading, and arithmetic. These findings argue for the real benefits to children, families and the nation in programs that encourage good early childhood nutrition.
- Farmers will benefit from a new comprehensive publication describing risk management tools and strategies at the farm level.
- Trade negotiators representing national interests and those of farmers can now use a new classification scheme for assessing the economic impacts of technical trade barriers, such as sanitary and phytosanitary measures.
- Users of statistics on cattle will benefit from a first-ever combined U. S. and Canadian cattle publication providing information on both countries.
- Producers and markets will benefit from the first ever Census of Aquaculture, providing a complete picture of this rapidly growing sector of the agricultural economy which contributed almost $1 billion of sales in 1998.

As we take satisfaction in the REE agencies' tremendous success and the extraordinary possibilities of today's cutting edge research and technology, we must acknowledge that new

times demand new emphasis in our programs and new ways of doing business. I would like to take the opportunity to discuss a few of these new developments and how we are responding to them.

In a very real sense, the domestic agenda is a global agenda. Everything happening domestically has global ramifications. This is just as true for agriculture as any other area of national life. The 21st Century has brought globalization of all aspects of the food and fiber system, from competitive markets around the world, to diseases that know no national boundaries, to collaborative research among nations to resolve common problems. The REE agenda increasingly reflects that fact. The agencies are actively working with scientists and research institutions around the world, as well as collecting statistics and conducting analyses that look at U.S. agriculture as part of the world system. Whether conducted in the U.S. or in other countries, this research collaboration encourages an additional flow of new knowledge and technology that benefits U.S. agriculture. The increase in the quality of and access to information and data characterizing the food and agricultural sectors of other countries, promotes better market intelligence for domestic agriculture and for trade policy negotiations. This budget includes a new initiative that is responsive to this new reality and builds on the current international activities already carried out by REE agencies.

A second trend that the REE program is increasingly responding to is the growing influence of consumers and their need to have confidence in the science on which government policy and regulatory decisions are made. We have become a consumer driven society, a fact that directly affects agriculture and, therefore, the programs in USDA, particularly in the areas of food safety and the environment. Implementation of the Hazard Analysis and Critical Control Point (HACCP) approach to food safety and the Environmental Protection Agency's (EPA)

regulatory decisions on the use of pesticides under the Food Quality Protection Act (FQPA), rely heavily on sound science, statistics and analyses. Consumers and producers are demanding confidence in the science supporting such decisions. Recently consumers abroad, and to a lesser degree in this country, have raised questions about the underlying science and the appropriate application of biotechnology in agriculture.

The REE agencies are playing a major role providing the knowledge needed for science-based decisions. Part of this effort involves growing integration of the research, education and extension component of the REE programs, facilitating greater linkage between what scientists are examining and discovering and what consumers need and want to learn. This change is reflected in all four REE agencies by elevating the role of consultations with stakeholders, including those representing consumers, at all stages of the research process.

The third emphasis relates to the future scientific and professional workforce for the agriculture, food and natural resource systems. If U.S. agriculture is to keep its global leadership role and competitive position into the 21st century, it must have an appropriately trained, technical and scientific work force. And given the multi-year education training required, investments must be made now so that the country does not experience shortages in the future. Moreover, we must establish programs that facilitate the country benefitting from the talent found in all segments of our society. To do otherwise, would be to rob the nation of their valuable contributions. The budget proposes a significant increase in several programs in response to this critical issue for the future of agriculture and our country.

A fourth issue relates to how we do business with other departments across the government. We know that many of the problems the REE agencies address are complex and can benefit from partnering with other departments that bring different perspectives and capabilities

on issues of common interest and concern. REE is making every effort to make that collaboration happen with partners across the government, pooling our ideas and our resources to carry out more effective programs. Some current examples include collaboration with the National Aeronautic and Space Administration on precision agriculture, with the National Science Foundation on plant genome research, with the National Center for Health Statistics on a joint national food consumption survey, with Department of Energy on biobased products and bioenergy, with the Food and Drug Administration and the Centers for Disease Control on food safety, with the Office of the U.S. Trade Representative on trade negotiations, with EPA on the FQPA, and with the Department of Labor on education and child care for farm workers.

In our association with these departments and with the Office of Science and Technology Policy, we are working hard to create an understanding in the broader research community that the research carried out in or supported by USDA is an important component of the government- wide research and technology agenda. REE research agencies and agriculture have much to contribute to and gain from participation in this broader research and development agenda. In this context, it is important to emphasize that cutting edge research is carried out in ARS labs and in similar labs at universities and other non-profit research institutions supported through CSREES programs. ERS's analysis and NASS's statistical programs make critical contributions to policy, trade, and regulatory decisions. The more the USDA research and development, analysis and statistics programs are integrated in the Federal R&D effort, the stronger both the USDA and broader Federal program will be. Such participation will also benefit U.S. agriculture in attracting the broader scientific community to the issues of concern to the sector.

REE FY 2001 Initiatives

Before turning to the budgets of the REE agencies, I would like to highlight proposed increases for six high priority initiatives. They represent critical investments to meet today's and future challenges and opportunities for agriculture and the nation.

In response to the globalization of agriculture, the budget proposes a new initiative of $1.5 million to facilitate the globalization of agricultural research. While the level of funds is modest, the magnitude of the opportunities it provides to the ultimate benefit of America's farmers and ranchers is great. All four REE agencies currently are engaged in some international activities, however, much of the work is technical and scientific and is driven by funding from other government sources. These funds would support international activities focused on issues specifically of interest to domestic agriculture. The initiative will facilitate globalization of the agricultural programs in land grant and non-land grant colleges and universities and will support research on issues of importance to the U.S., but requiring collaboration with a foreign partner. The Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA), recognizes the many mutual interests among nations and authorizes competitive grants for collaborative projects between U.S. scientists and scientists from other nations, including the International Research Centers. Using authority under AREERA, CSREES will launch a competitive grants program that will provide funds to bring a more international involvement to the universities' and colleges' agricultural programs, including the curriculum, research agenda, teaching, and research experience. Complementing this grants program is funding to facilitate collaboration between REE agencies, primarily ERS, and foreign scientists and institutions on issues such as the acceptability of new varieties of crops in food importing countries and data and analysis on the actual magnitude and structure of major agriculture producing countries.

A second initiative focuses on the next generation of scientists and professionals needed to advance the frontiers of knowledge and technology in the agricultural, food and natural resources systems into the 21st Century. The initiative provides CSREES a $5.9 million increase for several programs to promote development of expertise by enhancing recruitment of students with strong science backgrounds into the food and agriculture disciplines and the capacity of institutions to assure that the students receive the high quality education required to respond to the needs of the food and agricultural systems. Both components put special emphasis on the need to recruit and train more historically under-represented racial and ethnic minorities in the food and agricultural sciences and the institutions that traditionally serve those minorities.

Developing and promoting biobased products and bioenergy is a third joint initiative with the Department of Energy in the proposed FY 2001 budget. The convergence of several important national developments argues for the value of this major new initiative. There is an urgent need for new products and new uses of existing agricultural commodities to expand markets for farm and forest products, in order to improve farm income and create post farm-gate processing and related business activity in rural America. Increasing concern regarding the long-term adverse environmental impact from continued use of non-renewable fossil resources and the nation's dependence on imported sources of energy make a strong case for a major long term investment to develop new biobased products, technologies and fuels. The initiative, which includes an REE increase of $25.7 million, will enhance implementation of the President's Executive Order No. 13134, "Developing and Promoting Biobased Products and Bioenergy," which ultimately aims to ensure that biobased products will be a major area of economic growth in the 21st century. Both ARS and CSREES are participating in the Department-wide initiative, conducting or funding research that supports the strategic goals of the initiative.

The public's increasing concern about the quality of the environment and the safety of our food, reflected in such laws as the FQPA, is a fact of life in the 21st century. While generally sharing the overall goals, producers find themselves in need of new pest control technologies that are effective and economically viable, while being responsive to public environmental and food safety concerns and specifically meeting FQPA requirements. Under the umbrella of FQPA implementation, the REE agency budgets include an increase of $25.4 million in the ARS, CSREES, and NASS budgets. The increases focus on providing EPA information and data essential for science-based implementation of FQPA and on advancing efforts to develop and transfer to producers environmentally sound and effective pest management technologies. It is critical that this data be collected, else EPA will have to rely on assumptions that more severely limit options available to producers.

Under the broader integrated pest management component of this ongoing initiative, significant progress has been made in developing sound pest management technologies and their adoption by producers. However, there is considerable distance to go in the pursuit of promising technologies and in the adoption of practices and technologies that take advantage of the newest discoveries coming out of IPM research. The initiative includes support to expand ARS's major IPM research program focused on control of key pests where currently organophosphates and carbamates are used primarily as management agents. Both the ARS and the CSREES budgets include funding requests to expand work with producers to test new technologies and practices and facilitate their adoption. These increases to promote adoption of technologies are critical, if the Nation is to benefit from the discoveries generated in laboratories.

Promoting food safety is a fourth issue in which the Administration and Department have a strong interest. While the U. S. food supply is one of the safest, if not the safest, in the world,

millions of Americans still become ill each year due to food-borne pathogens. Consumers increasing concern about the safety of all food has not waned.

USDA research has played an important role in the major strides that have been made over the past few years to improve our food safety system. On-going implementation of the Hazard Analysis and Critical Control Point (HACCP) approach to food safety relies heavily on USDA research. First applied to meat and poultry, the general approach is now being applied to fruits and vegetables, and to preharvest as well as postharvest activities, making it easier for farmers to adopt production practices that reduce the potential for pathogen contamination.

The REE component of the Food Safety Initiative in the FY 2001 budget provides increases to ARS and CSREES totaling $14 million, including increased funding through the National Research Initiative (NRI). The funds will focus on preharvest production and transportation issues, as well as postharvest processing and storage. Postharvest operations are key links in the food safety chain. In many cases, the operations are sources of pathogen contamination of meat, poultry, aquaculture products, and fresh fruits and vegetables. Research on understanding pathogens transmission during processing, therefore, is critical for developing operations that prevent contamination.

A fifth initiative I would like to highlight is agricultural genomics. We are only at the dawn of the age of biotechnology, yet its promise is well established. The science is solid and the potential to help producers reduce inputs and increase yields is clear. So, too, is the promise of biotechnology in developing foods with enhanced health promoting nutritional value and helping meet the food needs of a growing world population. However, harvesting the promise of this powerful technology depends on having an understanding of the genetic make-up of plants

and animals on which biotechnology depends and making responsible use of the tool to promote the interests of farmers and of consumers.

As a leader in the President's Food Genome Initiative, a government-wide initiative, USDA is making a major contribution to the larger effort, expanding our knowledge of genomes of species of importance to the food and agricultural sector. The FY 2001 budget calls for an increase of $14.8 million over FY 2000. ARS and CSREES programming under the USDA Agriculture Genome Initiative includes research on animals and microbes, as well as plants. This research, focused on gene structure and function, is expected to have considerable payoff for crop and animal species ranging from rice to corn and swine to poultry. Efforts in the USDA food genomics program will concentrate on identification of economically important traits that increase yield, quality and disease resistance in plants, minimize the need for pesticides, and protect the environment. The increases will also support new investments in bioinformatic tools, biological databases and information management technology, so researchers, database managers, and genetic resource managers can more effectively and efficiently use the vast amount of data being generated by genetic research.

These are the highlights of six REE initiatives. Fuller discussion of agency components of these initiatives can be found in the agencies' Explanatory Notes.

REE Agency FY 2001 Budgets

I would like to turn briefly to the budgets of the four REE agencies. The Agricultural Research Service (ARS) FY 2001 budget requests $894 million in ongoing research and information programs, a net increase of $64 million or 7.7 percent over FY 2000. The proposed increases will be dedicated to a broad range of the high priority programs, such as emerging infectious diseases, food safety, human nutrition, biobased products, invasive species, integrated

pest management, and climate change. To partially offset these increases, the budget also includes redirection of approximately $42 million in current programs to fund higher priority program initiatives of nationwide interest. As the principal intramural biological and physical science research agency in the Department, ARS continues to play a critical role for the Department and the larger agricultural community in conducting mission-driven research. Results from ARS's fundamental research provide the foundation for applied and developmental research carried out in many public and private institutions. Building on its own and other fundamental research, ARS also conducts applied research and technology development to solve specific problems of national and regional importance and to meet the research needs of other USDA agencies.

The ARS FY 2001 budget includes an increase of $17.3 million in the fourth year of the Human Nutrition Research Initiative. Research continues to confirm strong linkages between nutrition and health. It is hard to overestimate the potential payoff that healthy diets yield for individuals and society. At the scientific level and the personal level, increasing our understanding of the relationship between diet and health and of the sources of important nutrients will enhance our well-being and reduce our national health care bill. The FY 2001 increases will include research on the role of nutrition in bone growth; nutrition and cognition and brain function; and nutrition throughout the life cycle.

The FY 2001 ARS budget proposes $39.3 million for buildings and facilities of which $9 million is designated to plan and modernize ARS and Animal and Plant Health Inspection Service (APHIS) facilities in Ames, Iowa. ARS's National Animal Disease Center (NADC) and APHIS's National Veterinary Services Laboratories and Center for Veterinary Biologics are

critical national facilities for conducting research on animal diseases of economic importance to U.S. agriculture, for preventing the incursion of foreign diseases into the United States, and for regulating animal vaccines and diagnostics used in the United States, among other things. Most of the facilities are old and do not satisfy current requirements and expectations related to human and animal health and life safety issues and advances in biosafety and biocontainment measures. And there is a critical shortage of biocontainment animal space.

For FY 2001, $9 million is requested to plan and modernize facilities for ARS and APHIS. Specifically ARS is requesting $8 million to complete planning and design for new Biosafety Level 2 and 3 Animal Isolation Facilities and $1 million for utility distribution system improvements to support the new facilities. These facilities will be located on the NADC grounds and will be used by both ARS and APHIS scientists.

The remaining building and facilities increases are provided for major modernization in five other facilities. Included are the continuing upgrades to the existing facility at Plum Island. These increases for modernization are the product of careful planning over several years and are vital for ARS to continue its high quality and productive research for which it is world renowned.

The President's FY 2001 budget provides $1.096 billion for the Cooperative State Research, Education, and Extension Service. This includes $973 million in the discretionary budget, an increase of $22 million over FY 2000. Within the discretionary budget, the funding levels for the six formula programs remain the same as the FY 2000 appropriations. An increase of $31 million is provided for the National Research Initiative (NRI). The NRI increases will focus on high priority areas, including agricultural genomics, nutrition, invasive species, global change and food safety.

The budget also includes $120 million in mandatory spending under the AREERA for the Initiative for Future Agriculture and Food Systems. This competitive research, education and extension program will emphasize a multi-disciplinary and multi-institutional approach to addressing high priority issues outlined in the law. The Administration strongly believes that the most appropriate and effective use of taxpayer dollars is through peer-reviewed competitively awarded research grants that focus on national issues and concerns, conducted at the regional, state, and local level. Programs such as the NRI and the Initiative for the Future Agriculture and Food Systems provide a very effective mechanism for attracting and focusing the highest quality research conducted across the country on high priority issues faced by the agriculture and food system.

The CSREES budget includes increases to empower less advantaged people and communities so they may improve their own lives and that of their families. Increases for Children, Youth and Families At Risk program and Expanded Food and Nutrition Education Program will enhance programs that help individuals and families gain the skills and create the environment that encourage individuals, families and community leaders to take responsibility for their own lives and that of their communities. A third and new program would competitively award anti-hunger and food security grants to nonprofit organizations to support a variety of community-based activities that bolster local food systems to fight hunger. Finally, the budget provides $5 million for a new program to provide training for youth working on farms. Competitively awarded Extension grants would provide support for development of course materials, training, class costs and course evaluation activities.

In providing critical funding to the research, education, and extension programs of the Land Grant system and other universities and organizations across the country, CSREES continues to play a central role in helping generate new knowledge and technology and in facilitating the transfer of that knowledge and technology to farmers and others who will use it.

The Economic Research Service's budget reflects a net decrease of $10 million from $65 million in FY 2000 to $55 million in FY 2001. As the Department's principal intramural economics and social science research agency, ERS conducts research and analysis on the efficiency, efficacy, and equity aspects of issues related to agriculture, food safety and nutrition, the environment, and rural development. The net decreased funding level is due to the return of the $12.2 million food program studies to the Food and Nutrition Service, partially offset by increases of $2.2 million to support new or enhanced research. In addition to the increases in the initiatives highlighted above, the ERS budget includes $1 million to conduct a close examination of the structural changes in the agricultural and food sectors. ERS would focus on determining where concentration is occurring and who is affected and how, exploring and developing opportunities for farmers with this kind of market environment, and examining ways in which USDA and other parts of the government can aid farmers in adjusting to structural change. Additional funds of $0.7 million will support research on several aspects of carbon sequestration as part of the interagency initiative aimed at reducing greenhouse gases and mitigating other environmental problems while improving the economic performance of agricultural resources.

The National Agricultural Statistics Service (NASS) budget request shows an increase of $1.3 million from the FY 2000 budget to a total of $100.6 million due to three important new initiatives. Due to the economic situation confronting U.S. farmers today, NASS's

comprehensive, reliable, and timely data are critical for policy decisions, as well as production and marketing decisions. The proposed initiatives in the FY 2001 budget provide an increase of $1.3 million, offset by reductions of $0.7 million in lower priority survey work, to expand NASS's *Hogs and Pigs* reports to a monthly basis in keeping with swine reporting provisions of the FY 2000 agricultural appropriations bill; $800,000 to expand pesticide use surveys in order to promote science-based decisions regarding pesticides; and $1.4 million to upgrade and safeguard computer systems security so NASS can ensure its pledge of data confidentiality to farmers, ranchers, and agribusinesses and can guarantee no premature access to data in market sensitive reports before official release. Additionally, there is a $410,000 increase due to the cyclical nature of Census of Agriculture funding. Offsetting the increases is a decrease of nearly $2 million because of the completion of the Agricultural Economics and Land Ownership Survey (AELOS) in FY 2000. The results of the AELOS study are eagerly awaited since this is a once-in-10 years look at the economic situation of farm land owners who are off the farm, as well as those producers who are operating that land. Results from the successful and timely completion of the 1997 Census of Agriculture enabled NASS to conduct the Farm and Ranch Irrigation Survey, the decennial Horticultural Census, and the first ever Aquaculture Census.

Summary

In summary, I want to reiterate that, given an overall tight budget, the REE agencies' budgets reflect a strong commitment to investment in agricultural research, economics, statistics, education, and extension. It also reflects an understanding that research and education are critical for solving not only the problems agriculture and its producers are facing today, but emerging problems and opportunities of the 21st century. With continued strong investment, we will be

ready to meet those future problems and take advantage of new opportunities presented by cutting-edge science. Thank you. I welcome your questions.

USDA

Biographical Sketch

I. MILEY GONZALEZ
Under Secretary of Agriculture for Research, Education, and Economics



I. Miley Gonzalez was nominated by President Clinton as the under secretary of agriculture for research, education, and economics on July 9, 1997. He was confirmed for that position by the U.S. Senate on July 31, and sworn in on August 5.

Gonzalez provides oversight of the research, education and economics programs at USDA. He manages the Agricultural Research Service, the Cooperative State Research, Education, and Extension Service, the Economic Research Service, and the National Agricultural Statistics Service.

Before his appointment as under secretary, Gonzalez served on the National Agricultural Research, Extension, Education, and Economics Advisory Board--a 30-member group authorized by the 1996 Federal Agricultural Improvement and Reform (FAIR) Act to advise the Secretary and land-grant colleges and universities on agricultural research, extension, education, and economics policy and priorities. As the under secretary, Gonzalez is an ex-officio member of the group which will provide consultation on other FAIR Act legislation, including the Fund for Rural America.

Before joining USDA, Gonzalez served as associate dean and director for academic programs in the College of Agriculture and Home Economics at New Mexico State University (NMSU). From 1994-96, he was assistant dean and deputy director of the Cooperative Extension Service. Prior to that he served as professor and head of the Department of Agricultural and Extension Education at NMSU for three years.

Gonzalez worked on the Hispanic Association of Colleges and Universities/USDA leadership team, representing NMSU.

Before joining the faculty at NMSU, Gonzalez was an assistant director of International Agriculture Programs in the College of Agriculture at Iowa State University from 1988-91. In the early 1980s, Gonzalez served as a state 4-H specialist at Pennsylvania State University and participated in extension program activities.

His administrative experience began in 1976 at the University of Arizona as assistant director in the Office of Resident Instruction in the College of Agriculture. He has private sector experience in marketing, mangement, and production agriculture in both the U.S. and Mexico and worked on a cattle ranch in Venezuela. Gonzalez started his professional career as a high school vocational agriculture teacher in 1970 and taught at Parker High School on the Colorado River Indian Reservation in Parker, Ariz.

He has taught numerous undergraduate and graduate courses including guest lectures in Spanish. His

teaching has focused on problem-solving techniques, program planning and evaluation, curriculum development, and beginning teacher and extension agent training.

Gonzalez has served on numerous evaluation and task force teams at the local, national, and international levels. His research and scholarly activities have focused on the areas of international development, extension education, adult and non-formal education, technology transfer, and leadership development and training.

He has received numerous awards and honors from various professional groups, teachers, institutions and many other organizations such as 4-H and the FFA. He earned the American Farmer Degree in FFA and has received the Distinguished Service Award from the American Association of Agricultural Education for both domestic and international work in the western region.

He was born in Ysleta, Texas on July 30, 1946, grew up on a small farm and livestock operation in San Simon, Ariz., and managed farming and marketing operations in northern Mexico. Gonzalez attended the University of Arizona where he received both a B.S. and M.S. in agricultural education from the University of Arizona and a Ph.D. in agricultural and extension education from Pennsylvania State University.

AGRICULTURAL RESEARCH SERVICE

Statement of Dr. Floyd P. Horn, Administrator
before the Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies

Mr. Chairman and Members of the Subcommittee, I appreciate this opportunity to present the Agricultural Research Service's budget recommendations for FY 2001. Before I begin to outline the Agency's program and financing recommendations, I would like to take a moment to reflect on the truly amazing transformation that has taken place in American agriculture.

A hundred years ago, nearly 40 percent of employed people worked on farms. Today, less than 2 percent work on farms. In the span of a century, the number of farms has fallen by two-thirds, while the average farm size has more than tripled. This reflects increased off-farm employment opportunities and growing productivity in agriculture.

Farm production has become more concentrated. In 1900, 17 percent of U.S. farms produced 50 percent of farm sales. In 1997, only 2 percent of farms produced half of all agricultural sales.

American consumers are spending much less for the food they eat. In 1900, almost half of the consumers's spending was for food. Today, that share is down to 22 percent.

There has also been a dramatic increase in crop yields over the past 100 years. From 1900 to 1999, wheat yields have multiplied from 12.2 bushels per acre to 42.7 bushels per acre; corn, from 28.1 bushels per acre to 134.5 bushels per acre; soybeans, from 10.9 bushels per acre to 36.7 bushels per acre; cotton, from 203 pounds per acre to 592 pounds per acre; peanuts, 661 pounds per acre to 2,660 pounds per acre; and potatoes, from 52 hundred weight per acre to 348 hundred weight per acre.

Similarly, with higher crop productivity, animal production has jumped substantially. Chicken production has expanded more than 10-fold. Hog production has increased 3-fold. With significantly higher output per cow, milk production has also risen sharply.

Without question, many of the advances we have seen which have literally transformed American agriculture are the direct result of new technologies and practices which have been developed through agricultural research. It is **agricultural research** that has made possible the huge increases in agricultural productivity that we have seen.

Agricultural research is constantly adjusting to address new challenges of a dynamic world. At the beginning of the twentieth century, the emphasis of agricultural research was primarily on the

production of crops and animals and their protection from diseases and pests. The role of research has expanded beyond agricultural production efficiencies to include food safety, human nutrition, emerging diseases and exotic pests, new products and agricultural uses, sustainable agricultural practices, and natural resources conservation. Today, agricultural research embraces a variety of new approaches and technologies, from integrated pest management to remote sensing technologies and biotechnologies, and tools, from precision agriculture to bioinformatic tools and genetic sequencing. The new technologies and tools are being used to improve the nutritional value and safety of the food supply, convert agricultural materials to biofuels, manipulate the properties of plant and animal genes, etc.

Major ARS Accomplishments

During the past 10 years, ARS accomplishments have significantly benefitted American agriculture. Examples (organized under four broad goals) include:

AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

- Pioneering the concept of using gene markers to assist in selecting plants and animals for improving yield, imparting disease resistance, enhancing nutritional value, and making food products safer for the consumer.

- Publishing the first genetic linkage maps in the world for swine and cattle which were key contributors in the first genetic map for poultry.

- Organizing a multi-State areawide integrated pest management project to control the codling moth, the key pest affecting commercial apple and pear production in the Pacific Northwest. This initiative was so successful that pesticide usage was reduced 75 percent and products from the area were able to be exported to nations where they had been previously restricted. This strategy is now being followed for other important crop pests.

- Discovering and patenting a new method to immunize poultry from a number of diseases by injecting vaccines into the egg. Today, this technology protects 85 percent of North American broilers.

- Developing and releasing a new cotton variety with high fiber strength, which has enabled the industry to introduce new processes for wrinkle-resistant cotton slacks, and open a multi-billion dollar market.

A SAFE AND SECURE FOOD AND FIBER SYSTEM

- Cloning a plant gene conferring resistance to disease causing viruses. The ability to breed agriculturally important plants that are resistant to virus borne diseases is critical to preserving a secure food production system.

- Developing the first practical live animal test for scrapie in sheep, a disease similar to "Mad Cow" disease that has plagued Europe. This technology will allow producers to develop disease free flocks. APHIS is using the third eyelid test in their planning for a scrapie eradication

program in sheep.

- Developing a five minute test to identify bacterial contamination on meat. A second rapid detection test for E. coli is being used by commercial laboratories that screen ground meat for fast food restaurants and other retail food outlets.

- Developing a product called Preempt (TM) that can be sprayed over newly hatched chicks to reduce the potential for salmonella contamination. This technology, known as "competitive exclusion," will significantly decrease the potential for human illness from salmonella.

A HEALTHY AND WELL NOURISHED POPULATION

- Demonstrating that the nutritional status of a host can influence the pathogenesis of a known human viral pathogen.

- Producing the only reliable human studies on the effects of transfatty acids in the diet and their adverse impact on the risk factors for heart disease.

- Demonstrating how supplementing the diets of postmenopausal women with additional calcium and vitamin D lowers the rate of bone loss, slowing the development of osteoarthritis.

- Identifying how the brain function of children with certain nutritional deficits differs from those with good nutritional status.

- Maintaining the Nutrient Database which is the primary source of data on nutrients in food used in managing Federal nutrition programs and widely used throughout the food industry.

- Developing a series of high fiber, low calorie products (OATRIM, Z-TRIM and NU-TRIM) that can be used as fat substitutes in prepared foods.

AN AGRICULTURAL SYSTEM THAT PROTECTS NATURAL RESOURCES AND THE ENVIRONMENT

- Developing conservation tillage systems and crop residue management practices that have increased profitability and improved soil quality on hundreds of thousands of acres in the United States.

- Developing methods to remediate toxic element contaminated sites using specially designed biosolids compost. This approach has greatly reduced the remediation cost at some toxic metal contaminated "Superfund" sites.

- Developing an indexing tool for mapping the vulnerability of landscapes and locating areas with the greatest potential for contributing to water contamination by phosphorus. This index provides Federal and State agencies with the tools to manage watersheds to reduce water pollution.

- Developing the Riparian Ecosystem Management Model to provide landowners and environmental agencies with guidelines to design and manage forest buffers.

- Altering the nutritional or other end-use quality of certain grains to reduce their phytic acid, phosphorus, and mineral content. This research is focused on animal feeds and is designed to increase the absorption rates of nutrients by the animal while reducing the amount of phosphorus entering the environment.

- Screening thousands of American Elm trees to identify resistance to Dutch Elm disease. As a result, two new resistant varieties were developed and released to wholesale nurseries for propagation and sale to the public.

FY 2001 Budget

ARS' FY 2001 budget recommends a funding level of $894,258,000 which represents an increase of $63,874,000 above the Agency's FY 2000 level. This budget includes $97,815,000 in national high priority research initiatives, and $8,500,000 to finance pay costs. To help fund these high priority initiatives, the proposed budget also includes a reduction of $42,441,000 of both lower priority ongoing research and earmarked research projects added to the Agency's FY 2000 appropriation.

New and Expanded Research Initiatives

ARS' FY 2001 research initiatives are directed at maximizing productivity and product quality while preserving natural resources and environmental quality. The initiatives are also directed to the concerns of every American--for a safe, healthy, nutritious food supply. The specific research initiatives are detailed below.

AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

One of ARS' principal goals is to conduct research which results in strengthening U.S. agriculture at home and abroad. This is accomplished by developing new techniques and strategies to prevent or control insects and diseases which reduce economic losses and increase product longevity and market quality. Research is conducted which demonstrates new postharvest technologies that add value, improve quality, and overcome technical barriers to trade. ARS also carries out research which results in the development of new products and new uses for agricultural products. Under this goal, ARS is recommending in its FY 2001 budget new and expanded research initiatives in biobased products and new uses.

Biobased Products and New Uses (to expand markets, improve farm income, and reduce dependence on nonrenewable fossil fuels)
Biobased feedstocks and products are commercial and industrial products, other than food and feed, that utilize biological products or renewable domestic agricultural (plant, animal, and marine) or forestry materials in their production and manufacture. On August 12, 1999 the President signed an Executive Order 13101 to accelerate the development and commercialization

of biofuels and biobased products. Legislation to enhance this program area was also introduced by the Congress. Biobased products research is a high priority for several reasons. First, there is a need for new products and uses to expand markets for farm and forest products and improve farm income. Second, there is an increasing concern regarding the long term adverse environmental impacts from the continuing use of nonrenewable fossil resources. Third, our Nation is growing increasingly dependent on imported sources of energy and industrial feedstocks.

ARS is requesting an increase of $14,000,000 to develop biobased materials from agricultural commodities and byproducts; improve conversion of agricultural materials to biofuels; expand development of novel crops for value added products; improve biomass for energy; and increase our knowledge of fundamental biomaterials science. The proposed research will bring to commercialization an increased number of biobased feedstocks and products that can successfully compete in the marketplace with fossil fuel-based feedstocks and products. Success will increase the use of environmentally preferable feedstocks and products while reducing the use of those that add global warming gases to the atmosphere. Success will add new profit potential to old crops and create profitable new crops. Moreover, adoption of biobased feedstocks and new products will bring growth in processing and manufacturing businesses near to where the crops are grown, providing new off-farm jobs and income growth for rural America.

A SAFE AND SECURE FOOD AND FIBER SYSTEM

One of the Agency's principal goals is to perform research which will ensure that U.S. farmers and food processors have the technologies and resources necessary to produce a safe and secure food system. Under this goal, ARS is recommending in its FY 2001 budget new and expanded research initiatives in emerging and exotic diseases, invasive species, agricultural genome and genetics, and food safety.

Emerging and Exotic Diseases, and Pests (to reduce agricultural losses, protect the Nation from bioterrorism, and help ensure food safety)
Emerging and reemerging infectious diseases and pests during the past several years have become and remain a major public and animal health concern. The globalization of trade, increased international travel, climate change, intensive agriculture, and changing agricultural demographics have created new opportunities for reemergence and spread of infectious diseases and pests. Exotic (non-native) pathogens or pests once introduced into the U.S. can explode into an epidemic due to the absence of natural control agents and the lack of resistance of host animals. For emerging diseases to be detected and effectively controlled, the biology of the pathogens, pests, and parasites must be researched and strategies developed to limit their establishment and spread.

ARS is requesting a total increase of $4,358,000, which includes an increase of $3,750,000 for preventing and controlling emerging exotic and domestic infectious diseases of livestock and aquaculture, controlling livestock pests, and developing vaccines for brucellosis in wildlife, and an increase of $608,000 to prevent and control emerging and exotic plant diseases. The proposed

animal and plant disease research will lead to better diagnostic tests and improved control technologies and practices resulting in reduced production losses. It will also help ensure that the U.S. food supply remains the safest, healthiest, and least costly in the world.

United States agriculture is also extremely vulnerable to a deliberate introduction of highly infectious diseases and pests, particularly foreign diseases not endemic to the U.S. A recent GAO report cites that certain countries are engaged in developing biological warfare agents directed at animal and plant agriculture. Disease pathogens that could be used include highly infectious viruses, bacteria, nematodes, fungi, and insects that attack major commodities, such as cattle, swine, poultry, cereals, vegetables, and fruits. The malicious introduction of these pathogens would affect consumer confidence in the safety of their food and could have profound impacts on the U.S. economy. The potential impact of an outbreak of foot and mouth disease in cattle and swine in the U.S. was vividly demonstrated in 1997 in Taiwan where eight million pigs had to be destroyed causing $5 billion in economic losses, environmental consequences, and a total shutdown of their swine exports.

To protect U.S. agriculture from its vulnerability to acts of bioterrorism, ARS is requesting an increase of $10,000,000. Terrorist acts against U.S. agriculture have the potential to cost tens of billions of dollars and many lives. It is therefore necessary to take preventive action now. Research will focus on developing a forensic capability to rapidly identify highly infectious pathogens that have been turned into biological weapons. Also, new tools will be developed which will facilitate the epidemiological mapping of disease outbreaks and tracking of disease agents to their geographic origin. This new generation of technology will also substantially augment our traditional mission and capacity to deal with animal diseases that naturally or accidentally enter the U.S. and threaten the livestock industry.

Invasive Species (to detect and eradicate new invading weed and pest species)
Invasive weeds and other pest species cost the Nation over $122 billion a year. At last count, there were more than 30,000 invasive species in the U.S.--they impact production agriculture, organic farming, the environment, and other plant and animal species. For example, weeds such as purple loosestrife, leafy spurge, salt cedar, Brazilian Pepper, yellow starthistle, water hyacinth, downy brome, and melaleuca infest at least 100 million acres in the U.S. Arthropod pests, such as the silverleaf whitefly, Asian longhorned beetle, and Russian aphid destroy 13 percent of crop production each year. About one half of the endangered plants in the Nation are at risk because of invasive species. In 1999, the President signed an Executive Order on Invasive Species directing agencies to increase their efforts to detect and eradicate incipient populations and prevent invasive species from entering the U.S. Many Members of this Subcommittee are aware of these problems in your own States and districts.

In addressing the growing invasive species problem, ARS is requesting an increase of $4,300,000. Research will be directed toward developing pathogens for biological control of invasive weeds and insects. In addition, integrated management systems will be developed for weeds such as purple loosestrife. Also, new biological information, and the systematics of key groups of invasive weeds and insects will be developed. The proposed research will aid APHIS and other regulatory agencies, and State land managers in managing established invasive species,

and detecting and eradicating new invading species.

Agricultural Genome (to enhance the quality and safety of the food supply, and strengthen U.S. agricultural competitiveness in world markets)
The U.S. agricultural system faces formidable challenges, from new pests and diseases, water and soil pollution and degradation, climate events, and less land available for farming. These challenges can only be met by harnessing the inherent potential of genetic resources. More rapid and efficient methods are necessary to identify and manipulate the useful properties of genes and genomes. New methods termed "genomics," rely on more detailed, accurate, and comprehensive knowledge of genetic organization and function. This will enable scientists to examine the genetic potential of plants, animals, and beneficial organisms.

ARS is proposing an increase of $5,350,000 to develop bioinformatic tools, biological databases, and information management technology for plants. The research includes manipulating the function of important genes in crops, and developing new genomic approaches for improving economically important traits in livestock and poultry. In addition, marker genes of pathogenic microorganisms will be characterized to develop disease prevention in plants and animals. The proposed research will provide the means for maintaining and enhancing the quality and safety of the U.S. food supply. It will also strengthen the Nation's agricultural competitiveness in world markets by ensuring continued improvement of plants and animals.

Agricultural Genetic Resources (to protect the Nation's agriculture from genetic vulnerability, and strengthen U.S. agricultural competitiveness)
The U.S. needs a comprehensive program to maintain: crop germplasm; genetic diversity within animal species which provide abundant high quality food and fiber; and microbial germplasm, including pathogens and microorganisms, which may be useful in bioconversion, bioremediation, or biocontrol. Genetic diversity is critical for further improvement of production efficiency and for the protection of valuable germplasm from catastrophic events including climate change and disease epidemics.

ARS is requesting an increase of $6,600,000 to provide a program which will secure and maintain critical plant, animal, and microbial germplasm. Specifically, ARS will identify threatened germplasm and incorporate it into USDA/ARS gene banks. The germplasm will be preserved, documented, characterized, evaluated, and enhanced. The proposed germplasm program will protect U.S. agriculture from genetic vulnerability, and strengthen U.S. competitiveness in agricultural, pharmaceutical, and industrial markets by ensuring continued genetic improvement through an optimal pool of genetic resources.

Food Safety (to control pathogens and reduce food-related illnesses/deaths)
Food safety is a National Presidential priority. The Department is committed to providing consumers with the safest, highest quality food possible. It recognizes that food safety problems must be addressed and solved from the "farm-to-the-table." ARS' research begins at the preharvest stage of crop and animal production. It is there, during the production and transportation of animals to slaughter, that exposure and infection to pathogens takes place. This is a major source of contamination in meat-based foods. During production pathogens also

contaminate harvested fruits and vegetables. Similarly, toxic metals from soils and allergens contaminate various commodities.

ARS is requesting a total increase of $5,720,000. Within that total is a proposed increase of $2,860,000 for preharvest food safety research to develop methods for controlling pathogens during preslaughter and transportation, and develop technologies to extend the useful life of antibiotics. Toxins, heavy metals, and allergens which contaminate food products will also be researched. In addition, management and animal health practices will be developed to reduce Salmonella enteritidis on and in shell eggs.

Postharvest operations--slaughter and processing--are also key links in the food safety chain. Postharvest operations can provide an opportunity for removing or inactivating pathogens previously acquired during production. Pathogens can rapidly develop resistance to antimicrobials and traditional control measures.

ARS is also requesting an increase of $2,860,000 for postharvest food safety research. The proposed research will develop methods to: control pathogens in meat, poultry, and fruits and vegetables; detect pathogens and residues during processing and storage; and improve egg sanitation technologies and storage conditions to reduce contamination. Also, an Internet-based food safety research information system will be developed as part of the Food Safety Research Information Office established at the National Agricultural Library. The proposed pre- and postharvest food safety research will result in fewer pathogens in the production and processing environment thereby reducing consumer food-related illnesses and deaths.

Food Quality Protection Act (to reduce the use of pesticides which are harmful to humans)
The Food Quality Protection Act (FQPA) requires a change in the standard for evaluating pesticides from an acceptable risk/benefit to a reasonable expectation of no harm. This change in the evaluation standard is likely to affect the permissible uses in agriculture of many pesticides that can have toxic effects on humans.

USDA policy already places high priority on the funding, development, and testing of replacement technology for currently used pesticides at risk of being taken off the market due to the new FQPA tolerance standards. The Department is committed to implementation of IPM practices on at least 75 percent of the Nation's crop acreage. In addition, USDA supports efforts to develop areawide pest management programs using biointensive IPM approaches, IR-4 minor use pesticide programs, biological control agents, methyl bromide alternatives, and other IPM component technology.

In implementing FQPA, ARS is requesting an increase of $4,537,000. Research would be directed at expanding areawide IPM programs demonstrating alternatives to at-risk pesticides. IPM systems will be developed for fruits and vegetables treated with organophosphates and carbamates, and for pests under large scale control/eradication programs. In addition, methyl bromide alternatives will be developed and registered. The proposed research will develop new technologies and practices as substitutes for "hard" pesticides (e.g., organophosphate and carbamate pesticides) and provide new, target specific biointensive approaches to control crop

and other agricultural pests. The research will also contribute to fulfilling the Department's commitment to implement IPM practices or methods on 75 percent of the Nation's crop acreage. Within the amount requested, ARS is also requesting an increase of $1,500,000 to increase its support of the Department's Office of Pest Management Policy. Established in 1997, this office provides a coordinated and rapid response to FQPA data analysis needs, interacts with grower groups, and coordinates USDA programs with EPA.

A HEALTHY AND WELL NOURISHED POPULATION

A healthy diet is critical to an individual's growth and development, susceptibility to diseases, and their quality of life. Poor nutrition underlies many chronic conditions, such as obesity, cardiovascular disease, cancer, osteoporosis, and diabetes. Research is only now beginning to reveal how nutrients and genes interact to cause various diseases. Under this goal, ARS is recommending in its FY 2001 budget the largest increase for any one program area to support the President's Human Nutrition Research Initiative.

Human Nutrition (to reduce nutritionally-related diseases, and produce a more healthy, productive population)
The goal of the President's Human Nutrition Research Initiative is to improve the overall health of the American people by reducing health care costs and enhancing the quality of life by further defining the relationship between diet and health; improving the scientific basis of more effective food assistance programs; generating a more nutritious food supply; improving resistance to infection and immune disorders; promoting changes in diet by understanding the factors that affect food choices; and extending dietary guidance to nutritionally vulnerable groups by determining how food consumption at points in the life cycle affects risk of disease. In the first phase of the initiative, emphasis was placed on the dietary requirements of children. In the second phase, cutting edge research approaches such as molecular biology were applied to human nutrition to identify the role of nutrients in promoting health.

In this phase of the Initiative, ARS is requesting an increase of $17,250,000. Emphasis will be on the identification and measurement of the active components of a healthy diet; determination of the factors that maintain healthy body weight; role of nutrition in bone growth and maintenance; importance of diet in maintaining optimal neurological function throughout life; effects of diet on the immune function; role of nutrition throughout the life cycle; and development of nutritional biomarkers. In addition, the National Nutrient Databank (the database of foods consumed in the U.S. and the foundation for food composition tables) will be updated. The proposed research will lead to a reduction in the number of nutritionally-related diseases, and to a more healthy and productive population. This in turn will lead to a decrease in the staggering costs (estimated in excess of $200 billion per year) associated with the treatment of nutritionally-related diseases.

AN AGRICULTURAL SYSTEM THAT PROTECTS NATURAL RESOURCES AND THE ENVIRONMENT

Agricultural growth and enhanced productivity must be balanced with maintaining and preserving the Nation's natural resources. One of ARS' goals is to provide a better understanding of the complex interactions between agricultural production and the soil, water, and air. Under this goal, ARS is recommending in its FY 2001 budget new and expanded research initiatives in global climate change, climate change technology, air quality, and integrated science for ecological challenges.

Global Climate Change (to reduce the harmful effects of global climate change on U.S. agriculture)
Agriculture is vulnerable to changes in climate. Rising temperatures and changing amounts and patterns of precipitation can reduce crop yields. A changing climate can also alter the competitive relationships between weeds and crops, and the frequency of insect infestations and the severity of weed infestations which challenges our ability to control pests. Strategies and technologies need to be developed so that we better understand the effects of climate change thereby mitigating their impacts on agriculture.

ARS is requesting an increase of $7,900,000 for research on the effects of climate change on food availability; the impacts of atmospheric and climate change on the Alaskan agro-ecosystem; and the carbon cycle research initiative. In the carbon cycle initiative, ARS will collaborate with other Federal agencies in determining how farmers and ranchers can store carbon in agricultural soils to improve air quality. Rates of emissions of greenhouse gases associated with crop, livestock, and forage production systems will also be documented, and technologies to reduce them will be developed.

ARS will also conduct U.S. global change research program national assessment activities. Assessments assemble and synthesize scientific results, help increase interaction among scientists and the public, and aid in identifying gaps in knowledge. The national assessments and the other proposed global climate change initiatives will help mitigate the effects of global climate change. Accurate measurements of greenhouse gas emissions or rates of storage in agricultural soils will reduce climate change and assist in the prediction of future greenhouse gas concentrations.

Climate Change Technology (to expand biomass for energy, and predict/adapt to global change impacts)
By making changes in production and land use practices, agriculture can reduce greenhouse gas emissions. Practices such as, biomass conversion to fuels, improved animal management and waste utilization, conservation tillage, and other management practices (e.g., cover crops, buffers, etc.) will enhance long-term storage of carbon in soils. These practices will also increase energy efficiency, and improve soil tilth, fertility, and water holding capacity.

ARS is requesting an increase of $7,000,000 to develop new technologies both for predicting and adapting to global change impacts, and for improving and expanding biomass for energy. The

proposed research will provide farmers and ranchers with the means to adapt agricultural production methods in response to climate change. Expanding biomass for energy will contribute to sustainability, environmental quality, and efficiency of crop and livestock production, and forestall potential climate change.

Air Quality (to improve air quality)
With the adoption of the EPA's National Ambient Air Quality Standards, the role of agriculture in polluting air came under greater scrutiny. Concerns about the regulation of agricultural air quality prompted the establishment of the Agricultural Air Quality Task Force. The Task Force has identified the emission of particulates (which penetrate human lungs and cause various aliments) as its number one priority.

ARS is requesting an increase of $2,000,000 to develop new knowledge on particulate matter and precursors. New knowledge will also be developed on the emission and control of animal manure odors. In addition, research will be conducted on protecting agricultural crops from the effects of tropospheric ozone. The proposed research will make it possible to develop technologies to control or mitigate dust and odor emissions. Also, practices will be established to protect crops from ozone damage.

Integrated Science for Ecological Challenges (to protect the Nation's soil and water resources)
Changes in land and resource use, the introduction of invasive species, the input of pollutants and excessive nutrients, extreme natural events, and changes in atmospheric and climate conditions--these stresses and their cumulative effect on the Nation's ecological systems is poorly understood and raises numerous questions. The Federal agencies in the National Science and Technology Council, Committee on Environment and Natural Resources propose to begin addressing these major ecological questions under a broad coordinated effort entitled, "Integrated Sciences for Ecological Challenges."

ARS is requesting an increase of $6,800,000 under this initiative to protect the Nation's natural resources, by improving livestock manure management systems to protect evironmental quality; controlling eutrophication, harmful algal blooms, and hypoxia in waterways; restoring riparian zones and coastal habitats; developing practices for managing agricultural production while protecting soil and water resources; and conducting integrated ecosystem risk assessments. The overall goal of the proposed research is to protect the Nation's natural resources.

ENHANCING INFORMATION SYSTEMS

The National Agricultural Library (NAL) is the largest agricultural library in the world. Its print and electronic collections support the information needs of farmers, agricultural producers, researchers, policymakers, educators, and others. Under this goal, ARS is recommending in its FY 2001 budget enhanced support of its research and information programs.

Enhanced Support of Research and Information Programs (to preserve and increase access to agricultural research information)

The number and variety of electronic information resources in agriculture continues to increase. At the same time, NAL must improve access to printed agricultural literature currently maintained in its collection. NAL also must initiate a digital archiving program to ensure that the Department's digital publications are accessible in the future.

ARS is requesting an increase of $2,000,000 for increasing access to research information; updating and improving NAL's information delivery system; and preserving USDA digital publications. The proposed funding increase will ensure that NAL will be able to meet the growing needs of the agricultural community for rapid delivery of print and electronic information.

Pay Costs

The Agency is requesting $8,500,000 to cover part of the anticipated FY2001 pay raise. These funds are essential to the ongoing research effort of the Agency. The absorption of these costs over the last several years has eroded resources which has hindered the Agency's ability to hire new scientists, and procure equipment, materials, etc., which are critically needed to carry out ARS' research programs.

Project Terminations

ARS is recommending no new funding for earmarked projects funded in FY 2000, as well as lower priority projects. Resources that would have gone to these activities would be able to be allocated to high priority initiatives of national importance. None of the reductions in lower priority projects will be taken from the Administration's priority initiative areas.

Buildings and Facilities

Many of ARS' laboratories are inefficient and outdated. Major systems (i.e., water, heating, air-conditioning, electrical) in many of the laboratories have long passed their useful life expectancy and fail to meet building code requirements. The modernization or replacement of these laboratories which began several years ago remains a high priority.

In FY 2001, the Agency recommends under its Buildings and Facilities account $39,300,000 for the following modernization projects:

National Animal Disease Center, Ames, Iowa
The Center serves as USDA's primary animal health research facility. Its research is widely recognized as preventing and controlling animal diseases, and protecting the food supply. Scientists at the Center have developed vaccines for porcine parvovirus, bovine viral diarrhea virus, and brucellosis, and have developed diagnostic tools for hog cholera, bovine tuberculosis,

and scrapie.

In FY 2001, $9,000,000 is requested to plan and modernize facilities for ARS and APHIS. Specifically, ARS is requesting $8,000,000 to complete planning and design for new Biosafety Level 2 and 3 Animal Isolation Facilities, and $1,000,000 for utility distribution system improvements to support the new facilities. These facilities will be located on the NADC grounds and will be used by both ARS and APHIS scientists.

Beltsville Agricultural Research Center, Beltsville, Maryland
The largest agricultural center in the world, it is renowned for its prominent scientists, quality of research, and contributions to agriculture. Its research programs encompass natural resources and environmental sciences, plant sciences, livestock and poultry sciences, and human nutrition. In FY 2000, ARS received an appropriation of $13,000,000, primarily for modernization of the Beltsville Human Nutrition Research Center. In FY 2001, the Agency is requesting an increase of $13,300,000 to complete construction of the Beltsville Human Nutrition Research Center and for the modernization of the Building 307.

Western Regional Research Center, Albany, California
The Center conducts research principally on food safety and new agricultural uses. Research, however, is hampered by facilities which were built before World War II. In FY 2000, ARS received $2,600,000 for the design of a new Research and Development Facility. In FY 2001, the Agency is requesting $4,900,000 for the first phase of construction of the Research and Development Facility.

Plum Island Animal Disease Center, Greenport, New York
The Center conducts state-of-the-art research and diagnostic work on foreign diseases that are an ongoing threat to U.S. livestock. Located on an island off Long Island, the Center is the only site authorized by Congress to carry out such research. In FY 2001, ARS is requesting $7,000,000 for continuation of the modernization of existing facilities at the Center. No new construction is being proposed.

National Agricultural Library, Beltsville, Maryland
NAL is the largest agricultural library in the world and serves as a national resource for access to information on agriculture and related sciences. Built in 1968, many of the systems in the building are unreliable and require replacement. A 1991 facility condition study identified numerous mechanical, electrical, and architectural deficiencies. In FY 2001, ARS is requesting $1,770,000 to continue modernization projects currently underway.

U.S. National Arboretum, Washington, D.C.
The Arboretum was created by an Act of Congress in 1927 as a center for research and education on plant sciences. Since 1959, the Arboretum has been open to the public. Each year, thousands of residents and tourists who visit Washington, D.C. visit the Arboretum. A 1990 facility condition study of the Administration Building (which includes offices, laboratories, an auditorium, and an herbarium) found numerous building and system deficiencies. In FY2001, ARS is requesting $530,000 in design funds for the modernization of the Administration

Building, and $2,800,000 for replacement of the irrigation distribution system leading into the collections and research plots, and for installation of an automated control system.

Summary

In the span of a century, the face of American agriculture has changed dramatically--horses and mules have given way to power farm machinery, precision agriculture, remote sensing technologies, and bioinformatics. What has been achieved through agricultural research is truly remarkable.

As we begin a new century, we look ahead to the new opportunities and challenges that lie ahead. For the discoveries and advances that have not been made, ARS is hard at work. ARS is committed to solving the agricultural problems that affect both producers and consumers, and to improving the life of each and every American.

I will be pleased to respond to any questions that you may have regarding ARS' budget request.

BIOGRAPHICAL STATEMENT OF FLOYD HORN

Dr. Horn is Acting Under Secretary for Research, Education and Economics. From 1987 to his current appointment, Dr. Horn was the Director of the Agricultural Research Service's Southern Plains Area in College Station, Texas. Dr. Horn began his career with ARS in 1970 as a research animal scientist at its Grazinglands Research Laboratory, formerly known as the Forage and Livestock Research Laboratory, in El Reno, Oklahoma. He was appointed as the Director of the lab in 1973 before becoming in 1985 Associate Area Director for the Northern States Area based in St. Paul, Minnesota. A native of Winchester, Massachusetts, Dr. Horn earned a B.S. degree in animal science from the University of Maine, and M.S. and Ph.D degrees in ruminant nutrition from West Virginia University.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

Statement of Dr. Charles W. Laughlin, Administrator, before the Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies.

Mr. Chairman and Members of the Committee, I appreciate the opportunity to present the proposed fiscal year (FY) 2001 budget for the Cooperative State Research, Education, and Extension Service (CSREES), one of four agencies in the Research, Education, and Economics (REE) mission area of the United States Department of Agriculture (USDA). I am especially honored as this is my first opportunity to submit testimony to this Committee.

I have been the Administrator of CSREES for a little over eight months, having come to CSREES from the land-grant university system. Through the years I spent in that great system, first as a student and then as an educator, I gained an appreciation for the strong partnership the agency has forged with the land-grant system, other colleges and universities, and public and private research and education organizations.

Over the years, I have witnessed how funding from the broad portfolio of CSREES programs has taken scientific discovery from conception to application. Formula funds have leveraged dollars from other sources, provided the start-up funds needed for an investigator to establish a research program and obtain the results needed to compete successfully in a competitive program, and

allowed for a rapid response to an emerging problem. Competitively funded research from the National Research Initiative has supported individual investigators undertaking basic research aimed at generating new knowledge. Finally, research results were applied to real life problems through the Cooperative Extension System's outreach efforts. All of these efforts were undertaken in an environment which prepared students to meet the ongoing needs of agriculture, the environment, individuals and communities.

The broad portfolio of CSREES programs, whether formula based or competitively awarded, ensure that research leads to the transfer and implementation of practical outcomes. With this broad portfolio as a base, the strong Federal, state, and university partnership has supported great successes that have far reaching impacts on the food we eat, the environment in which we live, and the quality of life of our citizens. For example:

In an Animal Health Program in the School of Veterinary Medicine at the University of Minnesota, three investigators teamed up to study three important pathogens, Pasteurella multocida (a multispecies animal pathogen of major national importance), Cryptosporidium (primarily a disease of cattle causing morbidity in calves, but also an opportunistic cause of disease in humans), and Avian pneumovirus (a new and emerging disease of turkeys). University and National Institutes of Health (NIH) funds supported the establishment of a gene sequencing facility. The research on Pasteurella and the Pneumovirus was extended by a grant from private industry, while CSREES formula funds were used to support the initial gene sequencing. These preliminary studies, in turn, led to successful grant applications to the

National Research Initiative (NRI) and NIH. The NRI grant funds provided the sequencing of the entire Pasteurella genome, one of the first non-viral animal pathogens to have its entire genetic blueprint deciphered. The practical outcomes of this work have been enormous. First, for all three organisms, there has been the development of practical diagnostic kits and experimental vaccines based on knowledge gained from gene sequences. In the case of Avian pneumovirus, experiment station support allowed an accurate and sensitive diagnostic kit to be available within three months of obtaining the genome sequence. Two vaccines were developed within 12 months.

As a result of the development of the diagnostic kits and vaccines, extension professionals were able to work with producers to confine the spread of the disease and prevent a national epidemic. This example indicates how a variety of funding mechanisms may be necessary to take discovery research from conception to application. In particular, it demonstrates how formula funds provided to research directors can underwrite a new study such that it quickly becomes competitive. It shows how funds from one source can be used to leverage funds from another, and how both research and extension formula monies can be used to respond quickly to an emerging and potentially devastating disease that began at the local level but showed every likelihood of becoming a national catastrophe.

The questions before us involve not only important issues requiring the application of hard data and science, as in the scenario described above, but problems involving human behavior and motivation, complex social systems, and personal values. These questions require an agency that

is engaged, and an engaged agency must be organized to step up to today's and tomorrow's needs. The challenge to CSREES is to move from a knowledge-dissemination model to an engagement model, developing and sustaining mutually beneficial partnerships with a wide array of constituents. The FY 2001 budget strongly moves us in that direction.

The FY 2001 budget proposes an increase of approximately 2.3 percent in discretionary funds. CSREES is committed to seven overarching themes in its FY 2001 budget:

- *Increases for competitively awarded grant programs* such as the $30.7 million increase for the NRI;

- *Funding for targeted areas*, including Biobased Products, Invasive Species, and Pest Related issues;

- *Integrated research, extension, and education activities*, as evidenced by an increase of $36.6 million increase in the Integrated Activities Account;

- *A balanced program portfolio*, as evidenced by sustained support at the FY 2000 level for all formula programs;

- *Expanded partnerships to reach diverse audiences* through increases in funding for the 1890 and 1994 land-grant institutions, as well as for Hispanic-Serving Institutions; and through increases in programs that support the USDA Civil Rights Implementation Team Recommendations;

- *Development of human capacity* to address the need for a highly trained cadre of quality scientists, engineers, managers, and technical specialists in the food and fiber systems through increased funding for the Higher Education Programs and International Science and Education Grants; and

- *Streamlined management and improved accountability* of CSREES programs through increases for the Research, Education, and Economics Information System (REEIS), and through the integration of research, extension, and education under certain programs as intended in the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA).

FY 2001 Budget Highlights

The FY 2001 budget request is a conscious effort to address concerns raised about the distribution of funding between formula grant programs and competitive grant programs in the Administration's FY 2000 Budget. In order to reduce the disparity in funding between formula and competitive grant programs, the FY 2000 budget proposed $200 million for the National

Research Initiative and $489 million for the six major formula programs (a reduction from the FY 1999 enacted level of $540 million). In response to the concerns raised about this reduction, the FY 2001 budget has proposed to fund major formula programs at the FY 2000 enacted level of $542 million, and to request a more modest funding level of $150 million for the NRI. We hope that the Committee will recognize and respond to this action, and provide this more modest increase for the NRI.

One of the most crucial variables in the food and fiber system is scientific and professional human capital. The research and education agenda of the future depends on a highly trained cadre of qualified scientists, engineers, managers, and technical specialists. However, the higher education institutions that produce this essential human capital are confronted with two increasingly serious issues: expertise development and institutional development.
Increases are provided in the FY 2001 budget for several of the CSREES Higher Education Programs. An increase of $2 million is provided for the Food and Agricultural Sciences National Needs Graduate Fellowships Grants Program to expand support for the recruitment and training of outstanding graduate students in the food and agricultural sciences. An increase of $1.65 million is provided for the Higher Education Challenge Grants Program to enhance programs and capabilities for educating baccalaureate students in priority food and agricultural science areas, including food safety. An increase of $1 million is provided for the Multicultural Scholars Program which will support efforts to increase the multicultural diversity of the food and agricultural scientific and professional workforce .

The CSREES budget request reflects USDA Civil Rights Action Team recommendations to address disparities in funding and enhance the Department's cooperative efforts with institutions of higher education that are primarily devoted to the needs of minority students. An increase of $650 thousand is provided for the Hispanic Serving Institutions Education Grants program and an increase of $300 thousand is provided for the 1890 Institutions Teaching and Research Capacity Building Grants Program. CSREES is proposing an increase of $2.5 million for the Native American Institutions Endowment Fund to increase the endowment which will increase the interest earned on the endowment for use by the 1994 Institutions. CSREES also is proposing that the 1994 Institutions be authorized to use endowment income for facility renovation and construction and will encourage the 1994 Institutions to use the increased funding for that purpose. An increase of $0.5 million is provided for the second year of the 1994 Institutions competitive research program; an increase of $0.4 million is provided for the Extension Services at 1994 Institutions program; and an increase of $3.3 million is proposed for the Extension Indian Reservations Program to enhance the ability of extension agents to provide educational programs to isolated and under-served audiences on the reservations. Additionally, eligibility under the Section 406 Integrated Authority, first used in 2000 and for which a total of $76 million in 12 programs is requested in 2001, is open to colleges and universities, including the 1890 institutions.

Achieving sustained long-term improvement in the competitive position of United States agriculture relies critically on the Federal government's assurance that producers and marketers

have access to the basic tools for success. Studies have shown that successful producers (farmers, ranchers, and foresters) are better educated, more apt to adopt new technology, have lower costs of production, and take better advantage of or have more opportunities for spreading production and marketing risk across alternative enterprises and mechanisms, than their less successful counterparts. The FY 2001 CSREES budget proposes a new $9.6 million Biobased Products Program that will generate information and tools for farmers to grow, harvest, and handle alternative crops, and for manufacturers to convert renewable, raw materials to useful products for industry and/or consumers. The $4 million proposed for a new Small Farms Initiative will develop research, education, and extension programs in appropriate marketing strategies for small farms, business skills for small farmers, and help beginning farmers establish viable farm operations and enterprises. A proposed increase of almost $3.7 million will be focused on organic farming under the research and extension components of the Sustainable Agriculture Research and Education Program. An additional $1 million is requested for a new program to develop and implement biologically based pest management practices that mitigate the ecological, agronomical and economic risks associated with the transition from conventional to organic production systems.

Increases are proposed to support the development and application of new technology and management practices to replace the traditional pest controls that are at risk of being restricted or prohibited due to the Food Quality Protection Act of 1996 (FQPA). The budget proposes a $6 million increase to support long-term development and implementation of innovative pest management for major acreage crops, fruits, and vegetables through an integrated research,

education, and extension competitive grants program. A $2 million increase is proposed for the development of intermediate-term alternative pest controls for fruit and vegetable crops to replace pesticides at risk of not meeting the new FQPA requirements.

An additional $3 million is proposed for development of practical management alternatives and technologies for commodities affected by the methyl bromide phase-out now scheduled for 2005 under recent amendments to the Clear Air Act. The budget includes an increase of $1.5 million for a Regional Crop Information and Policy Centers program that will address high priority pest management needs of Federal and State regulators, extension personnel, and the public through a coordinated effort at the regional level. These programs, in conjunction with increased funding for the Critical Issues, Pest Management Alternatives, Minor Crop Pest Management, Expert IPM Decision Support System, Integrated Pest Management extension, and Pesticide Applicator Training programs, as well as sustained funding for the Integrated Pest Management research program, will ensure a more safe and secure food and fiber system.

Establishing the scientific basis for optimal health, developing knowledge of the eating habits of Americans, and modifying food intake behavior are critical components to having a well-nourished population. An increasingly important component to having a well-nourished population is empowering our communities to build their capacities to meet a greater share of their food needs. The FY 2001 budget proposes a new $5.25 million Anti-Hunger and Food Security Grants Program to provide support to non-profit entities for projects that reduce hunger, improve nutrition, bolster community food security, and help families move from poverty to self-

sufficiency. An increase of $2.3 million above the 2000 appropriated level also is proposed for the Expanded Food and Nutrition Education Program (EFNEP) to support nutrition education programs aimed at meeting the needs of undernourished segments of the population, especially children.

As a Nation, we increasingly value the environment - clean air and water, unique ecosystems, and pristine land. We recognize that, given the vast amounts of land being used in agricultural or forestry production, we must ensure that our production practices, as well as our public policies and programs affecting these practices, are consistent with the dual objectives of promoting competitiveness while preserving natural resources and environmental quality. To achieve these goals, a better understanding of the complex interactions between agricultural production and the environment is needed. An increase of $1.5 million is proposed for a new Invasive Species Program in FY 2001 to target invasive species issues on an ecoregional basis. Water Quality also is a serious national concern as reflected in the President's Clean Water Action Plan. We propose an increase of $3.2 million for the integrated research and extension water quality program that will support projects to investigate such issues as the linkage between agricultural practices and outbreaks of harmful algal blooms, which can lead to conditions that cause massive fish-kills, human health problems, and significant economic losses to the seafood industry.

Americans recognize that their quality of life depends largely on economic, physical, and institutional factors affecting their families, businesses, and communities. The fast pace of changes in these factors, and their increasingly complex interactions, present a growing

challenge. CSREES, in partnership with the land-grant university system, enhances the capabilities of individuals, families, and communities to improve their quality of life. An increase of $5 million is proposed for a new Youth Farm Safety Education and Certification Program for support to States to provide formal safety training and certification programs targeted to youth who are 16 to 17 years of age and working in agriculture to help mitigate farm-related injuries and deaths. The FY 2001 budget proposes an increase of $1 million for the Children, Youth, and Families at Risk program to enhance child care programs for those segments of the population in greatest need, including limited resource families, isolated farm and rural families, and families needing child care during non-traditional hours, such as families of migrant farm laborers.

CSREES strategies to ensure responsive and effective management of USDA's extramural research, extension, and education programs include: strengthening the Federal/State partnership; integrating research, extension, and education activities as appropriate; improving information management systems which are accessed by both internal and external users; and participating in efforts to improve financial management within USDA. The FY 2001 budget proposes an increase of $250 thousand for REEIS. Increased funding will help further the implementation of the system to enable CSREES and the REE mission area to meet the reporting requirements of the Government Performance and Results Act and help facilitate implementation of various reporting requirements and accountability provisions of AREERA.

The FY 2001 Budget also includes mandatory funding of $120 million for the Initiative for Future Agriculture and Food Systems under Section 401 of AREERA for competitive research, education, and extension grants to address critical and emerging agriculture issues. Mandatory funding also is available under the Fund for Rural America, where a minimum of $20 million is expected to be provided for a wide range of research, extension, and education activities. The budget also supports funding for the Community Food Projects grants program at $2.5 million (supported with mandatory funds provided by the Food and Nutrition Service Food Stamp Program).

An increasing portion of Federal funds will be distributed competitively to address the most critical needs of the agricultural community and fund the most highly meritorious projects. The increases proposed for competitive programs are partially offset by decreases in non-competitive projects slated for reductions due to constrained budget resources. The additional flexibility provided in AREERA, where a portion of the formula funds can be used to support either research or extension projects, allows states more authority to use Federal funds in addressing their highest priority needs.

Summary

The CSREES FY 2001 budget represents a critical investment in research, extension, education, and integrated programs that focus on the development and delivery of tools to help agriculture compete in the long-term, enhancement of the environment, improvement of human health, and development of human capacity.

CHARLES LAUGHLIN

Charles Laughlin is the Administrator of the Cooperative State Research, Education, and Extension Service (CSREES) at the United States Department of Agriculture (USDA). He holds a Ph.D. in plant pathology and physiology from Virginia Polytechnic Institute and State University, a M.S. degree in agronomy from the University of Maryland, and a B.S. degree in horticulture from Iowa State University.

Laughlin joined USDA on June 21, 1999, having served as Dean and Director of the College of Tropical Agriculture and Human Resources at the University of Hawaii-Manoa since July 1996. Prior to that, he was Director of the Colorado Agricultural Experiment Station at Colorado State University from August 1992 to June 1996.

From August 1983 to 1992, Laughlin served as the associate director of the Georgia Agricultural Experiment Station at the University of Georgia. He coordinated teaching and research programs at Mississippi State University's Department of Plant Pathology and Weed Science from November 1980 to August 1983.

His experience also includes serving in several different capacities at the College of Agriculture and Natural Resources at Michigan State University from 1969 to 1980. Those positions included assistant professor and extension nematologist, professor and assistant dean and director of academic and student affairs.

Laughlin joined Michigan State University after developing a nematology program for Florida while working as an Assistant Extension Nematologist at the University of Florida from 1968 to 1969.

Laughlin also served as a consultant to the Brazilian Ministry of Education and Culture for the strengthening of both undergraduate and graduate programs in agriculture. His international experience includes the recruitment and pre-assignment of Peace Corps agricultural and natural resource volunteers for the Phillippines, Thailand, Malasia and Nepal.

Laughlin served as an advisor to the Kellogg National Fellowship Program and Director of the Experiment Station Committee on Organization and Policy and the Academic Committee on Organization and Policy Leadership program. He is also a colleague of the Creative Education Foundation.

Statement by
Susan E. Offutt, Administrator
ECONOMIC RESEARCH SERVICE
Before the House Subcommittee on
Agriculture, Rural Development, Food and Drug Administration
and Related Agencies

Mr. Chairman and members of the Committee, I am pleased to have the opportunity to present the proposed fiscal year 2001 budget for the Economic Research Service (ERS).

Mission

The Economic Research Service provides economic and other social science research and analysis on efficiency, efficacy, and equity issues related to agriculture, food, natural resources, and rural development to improve public and private decision making.

Budget

The agency's request for 2001 is $55.4 million, a net decrease of $10 million from the 2000 appropriation. The net decrease consists of four parts: a $1 million increase for an initiative on structural changes and concentration in food and agriculture; a $.5 million increase to support a global research and outreach initiative; a $.7 million increase for a study on carbon sequestration; and a $12.2 million decrease for evaluations of food stamp, child nutrition, and

WIC programs. Funding for these evaluation studies in 2001 is included in the Food and Nutrition Service (FNS) budget.

ERS Contributions to Mission Area Goals

ERS shares five general goals with its fellow agencies in the Research, Education, and Economics (REE) mission area: 1) a highly competitive agricultural production system, 2) a safe and secure food supply, 3) a healthy and well nourished population, 4) harmony between agriculture and the environment, and 5) enhanced economic opportunity and quality of life for all Americans. These goals are fully consistent with the U.S. Department of Agriculture mission.

Goal I: The agricultural production system is highly competitive in the global economy.

ERS helps the U.S. food and agriculture sector effectively adapt to changing market structure and post-WTO and post-NAFTA trade conditions by analyzing the linkage between domestic and global food and commodity markets and the implications of alternative domestic and international policies on competitiveness. ERS economists analyze factors that drive change in the structure and performance of domestic and global food and agriculture markets; provide economic assessments of structural change and competition in the food industry; analyze how global environmental change, international environmental treaties and agreements, and foreign trade restrictions affect U.S. agricultural production, exports, and imports; and provide economic analyses that determine how fundamental commodity market relationships are adjusting to changing trade, domestic policy, and structural conditions.

ERS will continue to work closely with the World Agricultural Outlook Board and other USDA agencies to provide short- and long-term projections of U.S. and world agricultural production, consumption, and trade. Cooperative efforts will seek to understand how commodity price and farm income variability affect market performance and interact with Federal policies and programs. ERS has sustained the frequency of reporting on commodities' outlooks, while strengthening the analysis that leads to a better understanding of reported observations and reporting needs in a sector that is witnessing profound structural change. In addition, ERS will continue to work closely with the Foreign Agricultural Service and the Office of the U.S. Trade Representative to assure that agricultural negotiations under the auspices of the World Trade Organization are successful and advantageous for U.S. agriculture. Research will target issues that prevented the Administration from fully meeting its goals for the Seattle-round of WTO trade negotiations--namely, the interrelationships involved among biotechnology, intellectual property rights, environmental concerns, and agricultural trade. ERS' December 1998 publication of *Agriculture in the WTO* demonstrated the Agency's ability to provide critical information on the benefits of earlier trade rounds and the potential gains from further liberalization of key markets. ERS experts will provide critical technical expertise in taking a more in-depth look at China's evolving role in world agricultural markets, including its potential membership in the WTO. ERS will conduct research designed to significantly improve the understanding among decision makers of the changing structure of the food marketing chain (for example, the implications for producers of the increasing replacement of open markets by contractual arrangements and vertical integration). ERS will also continue to analyze the use and effectiveness of alternative marketing strategies and risk management tools in mitigating farm

income risk. ERS' 1999 publication of *Managing Risk in Farming: Concepts, Research, and Analysis* demonstrates the broad and deep knowledge that ERS brings to addressing the risk concerns of the sector.

ERS analyses can help guide and evaluate resource allocation and management of public sector agricultural research--a key to maintaining increases in productivity that underlie a strong competitive position for U.S. farmers. ERS economists track and seek to understand the determinants of public and private spending on agricultural R&D; evaluate the returns from those expenditures; and consider the most effective roles for public and private sector research entities.

Structural Change, Coordination and Concentration in Food and Agriculture

The request for an increase of $1,056,000 in FY 2001 is intended to greatly enhance research and the dissemination of information related to structural changes within the food and fiber system. These changes within the market structure can have far reaching impacts on farmers, consumers, rural communities, and U.S. competitiveness in international agricultural markets. Through this initiative, ERS will shed light on the appropriate role of agricultural policy in this new structural environment while looking at new ways to examine markets and conduct aggressive data collection programs. ERS will also examine opportunities for small farmers and rural communities to remain viable in the changing market structure.

Global Research and Outreach Initiative

The request for an increase of $500,000 is part of an REE mission area interagency initiative to focus research and outreach programs on international issues of vital interest to the U.S. food and agriculture sector and on alleviation of the causes of global food insecurity. ERS will develop programs which are designed to strengthen research and outreach capacity in developing countries. Through collaborative activities with institutions in selected developing and former Soviet Block countries, ERS will be able to access information needed to support substantive research on challenges to developing a better understanding of the global agricultural market within which the U.S. food and agriculture sector functions. In the process, institutional and professional relationships will develop that facilitate long term exchanges and continued access to needed information and data.

Goal 2: The food production system is safe and secure.

ERS focuses on improving the efficiency and effectiveness of public policies and programs designed to protect consumers from unsafe food by analyzing the benefits of safer food and the costs of food safety policies; efficient and cost-effective approaches to promote food safety; and how agricultural production and processing practices affect food safety, resource quality, and farm workers' safety. This research helps government officials design more efficient and cost-effective approaches to promote food safety. For example, ERS works closely with various USDA agencies and the Centers for Disease Control and Prevention (CDC) on pathogen reduction efforts, including Hazard Analysis and Critical Control Points (HACCP). The ERS research program provides detailed and up-to-date appraisals of the benefits of safer food, such

as reducing medical costs and costs associated with productivity losses from foodborne illnesses caused by microbial pathogens. Specifically, in 1999 ERS used data provided by the CDC's "FoodNet" active surveillance system to update estimates of the costs of foodborne disease caused by four major microbial pathogens (estimated at $9.2 to $10.2 billion annually), and collaborated with CDC staff to refine and update the methodology for measuring the cost of foodborne disease. In FY 1999, ERS established a new extramural research program to measure the benefits of safer food. ERS established a competitive selection process to award funding for cooperative agreements in food safety research. ERS awarded grants to Harvard University and the University of Wyoming to begin a multi-year effort to apply state of the art economic analysis to develop national estimates of the benefits of improving the safety of the Nation's food supply. In addition, ERS has undertaken new research on the costs of coming into compliance with various food safety policies, including assessment of the distribution of costs across the food industry and across different consumer demographic groups.

Understanding how food prices are determined is increasingly important in responding to domestic and international market events and opportunities that promote the security of the U.S. food supply. As the farm share of the food dollar declines, accurate retail price forecasts depend more heavily on understanding the marketing system beyond the farmgate. ERS systematically examines the factors that help set retail prices, including an assessment of the roles of the transportation, processing, manufacturing, wholesaling and retailing sectors, the impact of imports and exports, and linkages to the total economy.

Goal 3: The nation's population is healthy and well-nourished.

ERS helps identify efficient and effective public policies that promote consumers' access to a wide variety of high-quality foods at affordable prices. ERS economists analyze factors affecting dietary changes as well as trends in America's eating habits; assess impacts of nutrition education and the implications for the individual, society and agriculture; and provide economic evaluations of food nutrition and assistance programs, such as factors determining changes in Food Stamp program participation. In addition, ERS studies the implications for producers and consumers of movement towards adoption of the dietary guidelines, evolution of trade in food products, and the determinants of food prices.

Analysis of nutrition education efforts considers what kinds of information motivate changes in consumer behavior, the food cost of healthy diets, the influence of food assistance programs on nutrition, and the implications of healthy diets for the structure of the food system. In 1999, ERS released the study, *America's Eating Habits: Changes and Consequences,* which poses questions and answers on several issues including: what are the economic costs associated with unhealthy eating habits; how much do people know about nutrition; how do national income and prices and demographic trends affect nutrient intake; and how do Government programs and regulations influence food expenditures and consumption. Since trade in high valued agricultural products now exceeds the value of bulk commodity flows, ERS will spend more time to disaggregate the components of these trade flows, understand their relationships to international investment and strategic behavior of U.S. food firms, and investigate the implications for U.S. consumers of a globalized food marketplace.

Goal 4: Agriculture and the Environment are in Harmony.

In this area, ERS research and analytical efforts in cooperation with the Natural Resource Conservation Service (NRCS) support development of Federal farm, natural resource, and rural policies and programs. Such efforts promote long-term sustainability goals, improved agricultural competitiveness, and economic growth. This effort requires analyses of the profitability and environmental impacts of alternative production management systems in addition to the cost-effectiveness and equity of public sector conservation policies and programs. ERS analysts focus on evaluating the benefits and costs of agricultural and environmental policies and programs in order to assess the relationship between improvements in environmental quality and increases in agricultural competitiveness. For example, in its 1999 publication *Economic Valuation of Environmental Benefits and the Targeting of Conservation Programs: The Case of the CRP,* ERS demonstrated that targeting of land for inclusion in the Conservation Reserve Program with the use of a new environmental benefits index approximately doubled the benefits of outdoor activities affected by the CRP--particularly freshwater-based recreation and wildlife viewing. The ERS research report, *Economics of Water Quality Protection from Nonpoint Sources* (released in November 1999), compares and contrasts five different approaches to the prevention or resolution of the type of water quality problems most frequently associated with agriculture. This serves as a guide to agriculturally-related program development under the Clean Water Act. ERS is working with NRCS to provide a combination of economic, farm structural, and geographic information to inform ongoing decision making about the regulation of animal waste.

ERS is putting increasing emphasis on understanding and analyzing trends in adoption of genetically modified crops and the emergence of markets for both genetically modified and non-genetically modified commodities--becoming a leader in the public sector in releasing new and timely information on this topic. For example, ERS was the first government agency to provide and interpret survey data on the extent of adoption of genetically engineered soybeans, cotton, and corn. This included information on impacts on pesticide use, crop yields, and net returns.

Carbon Sequestration Initiative

This initiative will focus on the economic potential for domestic carbon sequestration and control of greenhouse gases (GHG) in agriculture, the use of economic incentives to encourage carbon sequestration on agricultural lands, and the potential to target USDA conservation programs to promote GHG mitigation activities in the farm sector. A request of $700,000 for this initiative would allow ERS to analyze the economic potential of alternative practices that increase soil carbon levels and identify the most efficient policies to facilitate adoption of soil carbon building practices. It would also enable ERS to collaborate with researchers around the world to incorporate estimates of carbon sequestration in global economic models, as well as to consider the potential for other GHG mitigation efforts on agriculture. This would build on modeling work to estimate the impacts of climate change on agriculture which links to the broader issue of threats to global agricultural sustainability such as water quantity and quality and land constraints and soil degradation.

Goal 5: Enhanced economic opportunity and quality of life for rural Americans.

The ERS contribution to this goal is based on analysis that identifies how investment, employment opportunities and job training, and demographic trends affect rural America's capacity to prosper in the global marketplace. ERS economists analyze rural financial markets and how the availability of credit (particularly Federal credit) and public spending, taxes, and regulations influence rural economic development. ERS analyzes the changing size and characteristics of rural and farm populations and the implications of these changes on the performance of rural economies. In addition, ERS studies the economic structure and performance of non-farm economic activities in rural areas, including the rebound in population growth in non-metropolitan counties.

ERS will also monitor rural earnings and labor market trends with emphasis on regional and other disaggregations in order to provide insight into the determinants of variation in trends among rural counties. Such work should yield a better understanding of the factors that promote rural vitality and the opportunities for effective public sector intervention.

Because the effects of changes in welfare programs may vary between rural and urban residents, ERS social scientists will track implementation of recent program changes to understand impacts unique to rural residents. In particular, ERS analysis can help anticipate changes in participation across assistance programs for rural housing and for food security. For example, ERS has conducted the first nationally representative sample survey of participants in USDA's Section 502 rural housing program. Responses indicated that without the Section 502

program, 90 percent of borrowers thought it would have taken longer than 2 years, if ever, for them to be able to buy a comparable home. Another opportunity for understanding whether rural America faces unique circumstances will come with analysis of a recently-completed survey designed to determine characteristics of the rural manufacturing sector.

ERS continues to monitor the financial situation of the farm sector through establishing farm business organization and performance benchmarks. This task includes study of the financial position of farmers who employ technological advances and innovative risk management strategies in their businesses, compared with the financial position of farmers who use more traditional approaches. ERS has developed and widely disseminated a new farm typology that goes beyond the traditional classification of farms by sales class alone to a grouping that is much more reflective of operators' expectations from farming, stage in their life cycle, and dependence on agriculture. The development of the typology brings new understanding about the diversity of the U.S. farm community and the factors that can enhance success among small and minority-owned farms.

Customers, Partners, and Stakeholders

The ultimate beneficiaries of ERS's program are the American people whose well-being is improved by informed public and private decisionmaking leading to more effective resource allocation. ERS shapes its program and products principally to serve key decision makers who routinely make or influence public policy and program decisions. This clientele includes White House and USDA policy officials and program administrators/managers; the U.S. Congress;

other Federal agencies and State and local government officials; and domestic and international environmental, consumer, and other public organizations, including farm and industry groups interested in public policy issues.

ERS depends heavily on working relationships with other organizations and individuals to accomplish its mission. Key partners include: the National Agricultural Statistics Service for primary data collection; universities for research collaboration; the media as disseminators of ERS analyses; and other government agencies and departments for data information and services.

Closing Remarks

I appreciate the support that this Committee has given ERS in the past and look forward to continue working with you and your staff to ensure that ERS makes the most effective and appropriate use of the public resources. Thank you.

January 1996

SUSAN E. OFFUTT

Susan E. Offutt became Administrator of the Economic Research Service on January 21, 1996. The Economic Research Service is an agency that provides economic and other social science information and analysis for public and private decisions on agriculture, food, natural resources, and rural America.

Prior to becoming Administrator of ERS, Susan was the Executive Director of the Board on Agriculture and Assistant Executive Officer at the National Research Council of the National Academy of Sciences. The Board conducts studies and holds conferences on a range of topics in agricultural science, including work on the future of the land grant colleges of agriculture, precision farming, forest management, animal nutrition, biological and conventional pest control, and animal welfare.

Before taking over at the Board in January 1992, Susan was chief of the agriculture branch at the Office of Management and Budget. During her tenure there she coordinated budget and policy analyses of the 1990 farm bill for the Executive Office of the President.

Susan is also an alumna of ERS, having served as a section leader in the old Resources and Technology Division in 1987/88. Before that, she spent a year as a cooperative researcher with RTD in 1985/86, while on leave from her position as assistant professor at the University of Illinois, where she taught econometrics and public policy in the agricultural economics department. Her disciplinary research interests include commodity market instability and structure and the economics of the development and adoption of new technologies.

Susan was born in Newport, Rhode Island. Susan received a B.S. degree from Allegheny College (1976) and a M.S. (1980) and Ph.D. (1982) from Cornell University

NATIONAL AGRICULTURAL STATISTICS SERVICE

Statement of R. Ronald Bosecker, Administrator, before the Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies.

Mr. Chairman and members of the Committee, I appreciate the opportunity to submit a statement for this Committee's consideration in support of the fiscal year 2001 budget request for the National Agricultural Statistics Service (NASS). This Agency now conducts the census of agriculture which was begun in 1840, and the agricultural statistics program created in 1842. The basic mission of both programs is to provide factual information for and about the Nation's food and agricultural industry.

As American farms and ranches have progressed to making greater use of agricultural science and technology, the need for more detailed information has increased. The periodic surveys and censuses conducted by NASS contribute significantly to the overall information base for agricultural producers, handlers, processors, wholesalers, retailers, and ultimately, consumers. Voids in relevant, timely, accurate data contribute to wasteful inefficiencies throughout the entire production and marketing system.

The most critical complaints received by NASS occur when there is an absence or shortage of official data available for a commodity, and therefore that segment of agriculture is forced to operate with insufficient information. Recent environmental concerns have meant that entirely

new surveys are needed to accurately measure the chemicals used by the food and fiber industry. The globalization of agricultural commodity markets also increases the demand for relevant, accurate, timely, and impartial statistical information to assist those who sell U.S. agricultural commodities worldwide. For example, information concerning genetically engineered crops and crop varieties will enable the United States to better compete in the world market.

The crop, livestock, and other related statistics are provided throughout the year, in cooperation with each State Department of Agriculture. This program, which began in 1917, has served the agricultural industry well and is often cited by others as an excellent model of successful State-Federal cooperation. The addition of the census of agriculture, which provides a wealth of detailed information at the State and county level, has strengthened NASS's partnership with its State cooperators. This joint State-Federal program helps meet State and national data needs while minimizing overall costs by consolidating both staff and resources, eliminating duplication of effort, and reducing the reporting burden on the Nation's farm and ranch operators. The success of this partnership was demonstrated this past year as NASS, through its State-Federal cooperation, was able to complete the census in almost half the time of previous censuses, increase the total response, and, through the use of a toll-free number, better respond to questions from farmers and ranchers completing the census questionnaires. NASS's 45 field offices, which cover all 50 States (New England States are combined), support the six goals and outcomes in the Research, Education, and Economics (REE) mission area strategic plan by providing statistical information that serves national, State, and local data needs.

NASS statistics contribute to providing fair markets where buyers and sellers alike have access to the same official statistics. This prevents markets from being unduly influenced by "inside" information which might unfairly affect market prices for the gain of an individual market participant.

With the enactment of the Federal Agriculture Improvement and Reform Act of 1996, the demand for agricultural statistics has increased as producers make production decisions based solely on market information. Empirical evidence indicates that an increase in information improves the efficiency of commodity markets. Information on the competitiveness of our Nation's agricultural industry will become increasingly important as producers rely more on the world market for their income.

NASS's agricultural statistics are used throughout the agricultural sector to evaluate supplies and determine competitive prices for world marketing of U.S. commodities, which directly supports Goal 1 of the REE Strategic Plan: *Through research and education, empower the agricultural system with knowledge that will improve domestic production, processing, and marketing to successfully compete in the global market.*

Through new technology, the products produced in the United States are changing rapidly. This also means that the agricultural statistics program must be dynamic and able to respond to the demand for coverage of newly emerging products. For example, genetic engineering technology will be producing new commodity varieties, such as BT corn and cotton, and Roundup Ready soybeans. Data users are already requesting information on genetically modified crops in order to help assess the magnitude and impact of these new varieties.

Not only are NASS statistical reports important to assess the current supply and demand of agricultural commodities, but they are also extremely valuable to farm organizations, commodity groups, and public officials who analyze agricultural policy, foreign trade, construction, and environmental programs, research, rural development, and many other activities. NASS numbers are scrutinized very closely by producers, agribusinesses, industry analysts, economists, investors, as well as government policy makers. As a result of their analysis, major decisions are made that affect the Nation's agricultural economy.

All reports issued by NASS's Agricultural Statistics Board are made available to the public at previously announced release times to ensure that everyone is given equal access to the information. NASS has been a leader among Federal agencies in providing electronic access to information. All of NASS's national statistical reports and data products, including graphics, are available on the Internet, as well as in printed form. Customers are able to electronically subscribe to NASS reports by clicking on the appropriate release. A summary of NASS and other USDA statistical data are produced annually in USDA's *Agricultural Statistics*, available on the Internet through the NASS Home Page, on CD-ROM disc, or in hard copy. Each of NASS's 45 field offices have Home Pages on the Internet, which provide access to special State statistical reports and information on current local commodity conditions and production.

Beginning in fiscal year 1997, NASS received funding for the census of agriculture which is conducted every 5 years. The transfer of the responsibility for the census of agriculture to USDA streamlines Federal agricultural data collection activities and has improved the efficiency, timeliness, and quality of the census data. The release of the 1997 Census of Agriculture on

February 1, 1999, came exactly one year from the date the questionnaires were due to be returned by the Nation's farmers and ranchers.

Statistical research is conducted to improve methods and techniques used in collecting and processing agricultural data. This research is directed toward providing higher quality census and survey data with less burden to respondents, producing more accurate and timely statistics to data users, and increasing the efficiency of the entire process. For example, NASS has been a leader in the research and development of satellite imagery to improve agricultural statistics. The NASS statistical research program strives to improve methods and techniques for obtaining agricultural statistics with an acceptable level of accuracy. The growing diversity and specialization of the Nation's farm operations have greatly complicated procedures for producing accurate agricultural statistics. Development of new sampling and survey methodology, along with intensive use of telephone and face-to-face contacts and computer technology enable NASS to keep pace with an increasingly complex agricultural industry. Considerable new research will be directed at improving the 2002 Census of Agriculture to be conducted in 2003.

NASS performs a number of statistical services for other Federal, State, and producer organizations on a cost-reimbursable basis. In addition, NASS has an expanding international program to provide technical assistance to a number of countries on a cost-reimbursable basis.

Major Activities of the National Agricultural Statistics Service (NASS)

The primary activities of NASS are to conduct periodic surveys and the census of agriculture every 5 years to meet the current data needs of the agricultural industry. The periodic surveys

include the collection, summarization, analysis, and publication of reliable agricultural forecasts and estimates. Farmers, ranchers, and agribusinesses voluntarily respond to a series of nationwide surveys about crops, livestock, prices, chemical use and other agricultural activities each year. Periodic surveys are conducted during the growing season to measure the impact weather, pests, and other factors have on crop production. Frequent surveys are also needed for food products that are perishable. Many crop surveys are supplemented by actual field observations in which various plant counts and measurements are made. Administrative data from other State and USDA agencies, as well as data on imports and exports, are thoroughly analyzed and utilized as appropriate. NASS prepares estimates for over 120 crops and 45 livestock items which are published annually in almost 400 separate reports.

Agricultural reports issued by NASS include: number of farms and land in farms; acreage, yield, and production of grains, hay, oilseeds, cotton, tobacco, major fruits and vegetables, floriculture, and selected specialty crops; stocks of grains; inventories and production of hogs, cattle, sheep and wool, goats, catfish, trout, poultry, eggs, and dairy products; prices received by farmers for products; farm real estate values and land rental rates; prices paid by farmers for inputs and services; cold storage supplies; agricultural labor and wage rates; agricultural chemical usage; crop production cultural practices; and other data related to the agricultural economy.

The census of agriculture provides national, State, and county data for the United States on the agricultural economy every 5 years, including: number of farms, land use, production expenses, farm product values, value of land and buildings, farm size and characteristics of farm operators, market value of agricultural production sold, acreage of major crops, inventory of livestock and

poultry, and farm irrigation practices. The census of agriculture is the only source for this information on a local level which is extremely important to the agricultural community. Detailed information at the county level helps agricultural organizations, suppliers, handlers, processors, and wholesalers and retailers better plan their operations. Important demographic information supplied by the census of agriculture also provides a very valuable data base for developing public policy for rural areas. The local detailed data provided by the census of agriculture which facilitates locality-based policy and business decisions supports Goal 5 of the REE mission area Strategic Plan: *Empower people and communities, through research-based information and education, to address the economic and social problems facing our youth, families, and communities.*

Nearly two-thirds of NASS's staff are located in the 45 field offices; 24 of these offices are collocated with State Departments of Agriculture or land-grant universities. NASS's State Statistical Offices issue approximately 9,000 different reports each year and maintain Internet Home Pages to electronically provide their State information to the public.

NASS has developed a broad environmental statistics program under the Department's water quality and food safety programs. Until 1991, there was a complete void in the availability of reliable pesticide usage data which became evident during the Alar situation with apples. Therefore, in 1991 NASS cooperated with other USDA agencies, the Environmental Protection Agency (EPA), and the Food and Drug Administration, to implement comprehensive chemical usage surveys that collect data on certain crops in selected States. Beginning in fiscal year 1997, NASS also began survey programs to acquire more information on Integrated Pest Management

(IPM), additional farm pesticide uses, and post-harvest application of pesticides and other chemicals applied to commodities after leaving the farm. These programs have resulted in significant new chemical use data, which are important additions to the data base. These surveys, conducted in cooperation with the Economic Research Service, also collect detailed economic and farming practice information for the purpose of determining the use of IPM practices as well as to analyze the productivity and the profitability of different levels of chemical use. American farms and ranches manage half the land mass in the United States, underscoring the value of complete and accurate statistics on chemical use and farming practices to effectively address public concerns about the environmental effects of agricultural production. NASS's chemical use survey programs supports both Goals 2 and 4 of the REE Strategic Plan which relate to ensuring an adequate food and fiber supply and the promotion of food safety, and enhancing the quality of the environment.

NASS conducts a number of special surveys as well as provides consulting services for many USDA agencies and other Federal, State, and private agencies or organizations on a cost-reimbursable basis. Consulting services include assistance with survey methodology, questionnaire and sample design, information resource management, and statistical analysis. NASS has been very active in assisting USDA agencies in programs that monitor nutrition, food safety, environmental quality, and customer satisfaction. In cooperation with State Departments of Agriculture, land-grant universities, and industry groups, NASS conducted 122 special surveys in fiscal year 1999 covering a wide range of issues such as farm injury, nursery and horticulture, farm finance, fruits and nuts, vegetables, and cropping practices.

NASS provides technical assistance and training to improve agricultural survey programs in other countries in cooperation with other Government agencies on a cost-reimbursable basis. NASS's international programs focus on developing countries, such as those in Asia, Africa, and Central and South America, as well as emerging markets countries in Eastern Europe. Accurate information is essential in these countries for the orderly marketing of farm products. NASS works directly with countries undergoing the transition from centrally-planned to market economies by assisting them in applying modern statistical methodology, including sample survey techniques. This past year, NASS provided assistance to Chile, China, Ecuador, Ethiopia, Ghana, Guinea, Kazakhstan, Mexico, Nicaragua, Russia, South Africa, and Ukraine and received approximately $.9 million in reimbursements for these services.

NASS annually seeks input on improvements and priorities from the public through: displays at major commodity meetings, data user meetings with representatives from agribusinesses and commodity groups, special briefings for agricultural leaders during the release of major reports, and through numerous individual contacts, especially those made at the grass roots level through NASS's 45 field offices. As a result of these activities, the Agency has made many adjustments to its agricultural statistics program, published reports, and electronic access capabilities to better meet the statistical needs of customers and stakeholders.

Fiscal Year 2001 Plans

The fiscal year 2001 budget request is for $100,615,000. This is a net increase of $1,282,000 from the fiscal year 2000 current estimate.

The fiscal year 2001 request includes changes in activities associated with the census of agriculture, implementation of a monthly hog survey to improve market information, expansion of the agricultural chemical use surveys, and improvements to computer security to assure the integrity of market sensitive data prior to official release.

A net decrease of $1,490,000 and 12 staff-years for the census of agriculture.

The 2001 census of agriculture budget request is for $15,000,000. This includes an increase of $410,000 and 5 staff-years for increased activities associated with preparations for the 2002 Census of Agriculture. It also reflects a decrease of $1,900,000 and 17 staff-years for the Agricultural Economics and Land Ownership Survey. The survey will be completed in 2000 and is being removed from the budget since it is to be conducted only once every 10 years following alternate censuses of agriculture.

A net increase of $572,000 and 4 staff-years consisting of $1,272,000 for the monthly hog survey and a decrease of $700,000 for the quarterly hog survey.

Title IX-Livestock Mandatory Reporting, Subtitle C-Related Swine Reporting Provisions, Section 931. Improvement of Hogs and Pigs Inventory Report, which passed as part of the FY 2000 Agriculture Appropriations Bill in October 1999, states that the Secretary of Agriculture will publish on a monthly basis the *Hogs and Pigs Inventory Report*, and that for a period of 8 quarters after the implementation of the monthly report, the Secretary shall continue to maintain and publish on a quarterly basis the *Hogs and Pigs Inventory Report*. The purpose of a

monthly survey is to provide more timely information on market supplies of pigs than the present quarterly surveys provide.

The current NASS quarterly *Hogs and Pigs* report provides detailed information, by State, for the 17 largest hog producing States, accounting for 93 percent of the total U.S. hog inventory, together with all "other States" combined in order to provide U.S. totals. The proposed funding increase of $572,000 would provide, on a monthly basis, total breeding herd inventory, number of sows farrowed, pigs born, and number of sows bred. An offset of $700,000 will limit comparable quarterly and monthly State-level data to nine States covering approximately 77 percent of the total U.S. breeding herd inventory plus the U.S. total. Full funding at $1.272 million is necessary for NASS to implement a monthly breeding herd program which mirrors the existing quarterly program but provides important breeding herd data on a monthly basis. The goal is to provide more timely information on both the location and supplies of pigs to facilitate more orderly marketing of hogs.

An increase of $800,000 and 4 staff-years is requested for expansion of pesticide use surveys.

In order to accurately analyze the impact of chemical use as directed by the Food Quality Protection Act, EPA and USDA, together with other agencies and industry officials, have requested an expansion of NASS's current pesticide data collection program to include coverage of additional crops, sectors, and States. This additional funding would enable NASS to expand the number of field crops covered in the current pesticide use survey program in order to address existing data gaps. Pesticide usage survey information collected by NASS provides accurate data

which are critically needed by the agricultural industry, EPA, and others with an interest in the evaluation of pesticides, setting of pesticide residue standards, and the determination of exposure risks. In the absence of actual data, default assumptions or worst case scenarios are often used in chemical risk assessment analysis.

An increase of $1,400,000 is requested for development of NASS Computer Security Architecture.

There is a growing need for cyber-security given the increased incidences and threats of the loss, misuse, unauthorized access to, or modification of information on computer systems. The level of sophistication displayed by hackers and others also supports the need for security reforms, such as the need for early warning systems for attacks, intrusions, and viruses. Cyber-security has replaced Year 2000 as the top priority in the information technology community. Information security is of vital importance to maintain NASS's credibility given the market sensitivity of the reports released as well as the confidential nature of the data collected by NASS from the Nation's farmers, ranchers, and agribusinesses.

This concludes my statement, Mr. Chairman. Thank you for the opportunity to submit this for the record.

BIOGRAPHICAL SKETCH

Raymond Ronald Bosecker
Administrator
National Agricultural Statistics Service

Raymond R. (Ron) Bosecker grew up on a small farm in southern Illinois where he gained firsthand experience with hogs, cattle, corn, soybeans, wheat, hay, and farm upkeep. He graduated from Southern Illinois University (SIU) with a Bachelor of Science degree in Agricultural Economics in 1966 and received Master of Science degrees from Ohio State University in Agricultural Economics (1968) and Statistics (1972).

Mr. Bosecker began his career with the National Agricultural Statistics Service as a student trainee in the Illinois State Statistical Office. Upon graduation from SIU, he moved to the Ohio State Statistical Office, where he served as a commodity statistician. In June 1972, Mr. Bosecker transferred to Washington, D.C. where he served in several units, including Remote Sensing, Nonsampling Errors, Sampling Studies, Area Frame, and Statistical Methodology. He also provided technical guidance for developing or evaluating agricultural statistics programs in Tunisia, Haiti, and Bolivia.

In 1981, Mr. Bosecker became the Deputy State Statistician of the California State Statistical Office. In 1985, he returned to headquarters as Chief of Methods Staff, Estimates Division, and later became Chief of the Survey Sampling Branch, Research Division.

In June 1992, he was appointed Director of the Research Division. He was reassigned in April 1999 as Acting Deputy Administrator for Field Operations and recently was selected as Administrator to succeed Donald Bay in December 1999.

(February 2000)

PROPOSED DECREASES

Mr. SKEEN. Thank you, Dr. Gonzalez.

This year the President's budget proposes over $110 million in decreases for research projects delivered through the Agricultural Research Service and Cooperative State Research, Education, and Extension Service. Many of these projects have strong constituent support and are the type exemplified in your testimony, and the ARS product example bag we received today.

The rationale used for the project termination was either "not supporting national goals" or "non-competitively selected." What should we tell the dedicated scientists who are engaged in these important studies and negatively impacted by the budget proposal? And would you outline for us the process and criteria used to select the research projects proposed for termination and provide us with some alternative funding sources for these popular research projects?

Dr. GONZALEZ. Thank you, Mr. Chairman. As you know, we have had many discussions about the process that we undergo for making those determinations. In all cases——

Mr. SKEEN. That is nice to say, but the money keeps falling off of it.

A BALANCED PORTFOLIO

Dr. GONZALEZ. In all cases, I am confident that we are using—if I may use the example with our CSREES partnership with universities and colleges, and others in the research community, that we go through the deliberations of having a balanced portfolio that has those funds that are basic to the mission of these institutions, that continue to build capacity, that continue to bring the kind of science that is needed—I described it as cutting-edge to address pressing problems. And so there is a continuing dilemma of balancing the budgets for not only our agencies, but as we interact with those communities, of having the formula type of funding, as well as the competitive grants side of the agenda. As you know, this administration has been very strongly supportive of the competitive grants side of that agenda.

We have had our internal discussions about how we keep this balance in the portfolio. The criteria that we use in going through, of course, vary from program to program. It is difficult to make those decisions just using a broad brush. I think we need to go back and look at the efforts. Are they really contributing to a national agenda for our research initiatives? And I have described some of those this morning. There are others, of course, that fit in that level of importance. I am not sure that I have a specific answer, but we try and use our processes that are in place with our community. Internally, at our ARS research laboratories, it is the same kind of discussion. Our scientists know what our national program leaders have identified as those areas of consequence, new and emerging diseases, invasive species, and so on.

So there is a shift in our budget process to making sure that we are paying attention to those things that are newly emerging. Of critical importance to that is that we maintain over a long time the research basis that helps us to come up with answers in more or

less a short time frame. So it is a question that we continue to deliberate. There are a number of areas where I think your point is well taken that it puts our scientists at all levels, whether they are in-house or the scientists that we work with at universities, in this quandary about where and how long their funding is going to be available.

Having said that, I think part of our dilemma is—we talk about this in cooperation with the support that you provide us as a committee—that the research agenda is not something that we can always respond to in 5 months or 6 months or a short time period. But fund it annually——

Mr. SKEEN. It is not a drive-by service.

Dr. GONZALEZ. Yes. We fund it annually, but those programs may not yield results for 3 years or longer. And so I think it is part of that understanding of what the research agenda really needs and the support that we need financially to make sure that we have this basis, if you will, for the continuation of those excellent research programs.

Mr. SKEEN. Did you request funding for these projects in the Department's budget proposal to OMB?

Dr. GONZALEZ. Well, I know that we discussed the continuation of some of those programs within the broader set of those initiatives, and I don't know the detail. I am sure that we had recommended some of those within our discussions.

Mr. SKEEN. I just wanted to know if there was any specifically—there goes the wonderful tone.

Dr. GONZALEZ. Do I quit or do I still answer?

Mr. SKEEN. You are doing fine. Silence covers a lot of territory.

Dr. GONZALEZ. Yes, indeed.

Mr. SKEEN. Ms. Kaptur?

Ms. KAPTUR. Thank you, Mr. Chairman.

BIOBASED PRODUCTS AND BIOENERGY

Mr. Secretary, I am very interested in the Department's biobased fuels initiative, because I have been interested in this general area for a very long time and have worked very hard on the development of our clean coal technologies, our hydrogen technologies, any energy technology that would wean us off our dependence on foreign-produced oil where we now import over half of what drives this economy.

Could you put the administration's proposal in a little bit broader context for us? I notice in your testimony you say you were asking for $25.7 million in additional funds on page 8 of your testimony. When the Secretary was up here, he talked about $300 million. Could you discuss this biofuels initiative a little bit and how you are organized, the total amount of dollars that are being sought, and then what portion might fall within your jurisdiction?

Dr. GONZALEZ. Okay. Yes, thank you. The biobased products and bioenergy Executive order was signed in August by the President. We had already been working on a number of these areas related to the biobased products and bioenergy area at USDA and across the various agencies of the Department. We had a coordinating committee that we had named internally, and so when the initiative was signed, it gave us that additional visibility for us to move

in partnership with the colleagues at Energy, at NSF, EPA, and others of the Federal departments to work on this biobased products, bioenergy initiative.

So the organization as you look at broadening the scope of how we have worked with other agencies, there is an advisory committee that is to be named by Secretary Richardson to advise participating agencies and departments working jointly on this initiative. There are a number of things that we had already in place at USDA in our research arena for this biobased products, bioenergy area, and working with Forestry as well, looking at woody products. But certainly we have an opportunity of using cellulosic material for the production of fuels, in adding to the work that we have done in the past on ethanol and our biodiesel research. We have——

Ms. KAPTUR. Is that what is in our bag?

Dr. GONZALEZ. That is what is in your bag. That is one example. There are several products. So that our research laboratories at Peoria, in New Orleans, and out in California have been working—and other places, our Beltsville facility as well have been working on these promising areas of research and development.

Ms. KAPTUR. May I ask you, as you are answering my question, how much of an increase over existing programs are you actually seeking this year?

Dr. GONZALEZ. I would have to look at that number. Let me——

Ms. KAPTUR. I know it says on page 8 $25.7 million, but I think the Secretary's proposal was $268 million. I don't have a clear picture in my mind of the administration's overall initiative for these various agencies and how much it is an increase over existing activities. Obviously, if we had done a good job, we would already have the answer. So we don't. So I am trying to get a sense of what the new initiative is.

Dr. GONZALEZ. The new initiative, using the number that the Secretary used, includes $150 million from the CCC for the fuels side of that agenda. It has been part of what he has described as our safety net. There is an element there for biobased fuels.

Our request targets the research component that fits within that spectrum. There is an equal—I am not sure if it is an equal amount or probably a greater amount that Energy has requested, which also fits within the area of what they are doing. But specifically in our case, we are looking at our portion as being part of that broader—the larger number that the Secretary has used.

Ms. KAPTUR. From the standpoint of your researchers, how much of the fuel needs of this country could be filled by biobased fuels?

Dr. GONZALEZ. Well, I am going to have to turn for some help for an answer to that question because I don't know the specifics. But for those of us who gassed up this morning someplace, given the changing scenario in terms of our looking for long term, fuel security, I think there is a great opportunity in general for increasing the amount of fuel that we produce from our biobased products, whether it is corn or rice, soybeans. But I don't know the specific number.

I will ask Dr. Horn to help me with that.

Ms. KAPTUR. Thank you.

Dr. HORN. Well, the short answer is that we are pilot testing right now at Beltsville on some of our own equipment mixtures that contain 20 percent of diesel coming from an agricultural product and 80 percent fossil fuels.

In the budget, there is a $268 million figure which relates to the total funding overall, and in terms of the Agricultural Research Service, there is a request for a $14 million increase.

I am not sure if that helps distinguish it or not, but the request for the increase is $14 million.

Ms. KAPTUR. And that would be for more cellulose-based and——

Dr. HORN. Starch, cellulose-based as well. We have a number of research projects related to coal products, which are going to make a break at this economically. But it is a matter of grain crops, oilseeds, and animal fats being converted into ethanol and biodiesel, and then also some cellulosic products that would be more likely to be used, actually, in some other way for biofuels, not necessarily for biodiesel. This would be some other form of generating energy.

There are crops like switchgrass, for instance, that can be used as biofuels to burn and produce heat and, therefore, become an alternative energy resource, renewable energy resource. But in terms of biodiesel, most of that work is with grain crops and oilseeds.

Ms. KAPTUR. I know my time has expired, but, Dr. Horn, if you could provide additional information for the record on the breadth of the administration's proposal and then the portions that are USDA so we can see what portion it is of the overall administration initiative, and then the parts of it that are an increase, and specifically from the research standpoint, what the research hurdles are from your standpoint. Where haven't we solved some——

Dr. HORN. We would gladly do that, and actually there are other agencies here, including Economic Research Service, that have studied this. We could provide a comprehensive picture within that context.

[The information follows:]

The proposed funding for the Administration's Biobased Products/Bioenergy Initiative is as follows:

Biobased Products/Bioenergy Initiative
Program Levels
(Dollars in Millions)

	2000 Current Estimate	2001 Budget
USDA		
Agricultural Research Service	$46	$63
Commodity Credit Corporation	100	150
Cooperative State Research, Education, and Ext. Serv.	11	19
Forest Service	9	19
Natural Resources Conservation Service	5	9
Office of the Chief Economist	1	2
Rural Development	0	4
Risk Management Agency	0	1
Department Administration Staff Offices (DA)	a/	a/
Office of the Secretary	0	1
Total USDA	$172	$268
Department of Energy	$125	$174
Total, Biobased Products/Bioenergy	$297	$442

a/ Less than $500 thousand.

The research will focus on developing methods to transform biomass into energy and facilitating technology transfer. Research will also be conducted to develop new biobased materials, such as lubricants, adhesives, and building materials; develop new crops for value-added products; increase knowledge of fundamental biomaterials science; and improve conversion of agricultural materials into biofuels.

Ms. KAPTUR. And also the economics of it, if ERS has data, at what point do we reach a break-even in terms of producing some product that would be marketable.

Dr. HORN. There are some places in the country where it is nearly possible now, but normally fossil fuels outcompete. Now, of course, the price of fossil fuel is very high right now. We can provide that.

Ms. KAPTUR. Thank you.

Thank you, Mr. Chairman.

Mr. SKEEN. Mrs. Emerson?

Mrs. EMERSON. Thank you, Mr. Chairman, Dr. Gonzalez.

I just wanted to highlight a real important program that is operated by the Cooperative State Research, Education, and Extension Service, and that is agriculture in the classroom. It is something that is real important to folks in my district, and it does a great job of educating young people about agriculture and helps them understand how farmers and ranchers provide food and fiber to the world.

Would you briefly, describe for the subcommittee some of the accomplishments of this program?

AGRICULTURE IN THE CLASSROOM

Dr. GONZALEZ. Yes, thank you very much. We very much appreciate the support for that part of our educational agenda. It is an effort in addition to our own activities of ag in the classroom that has brought together a number of others that are involved in this literacy training and the understanding of the importance of agriculture in all of our lives, but it is particularly for young people. We are trying to bring a coalition of educational entities such as Food, Land and People and others, the Delta Academy, Gardening in Every School, that are working on these issues to help leverage some of the activities that we have.

As far as successes, we have been able to develop curricular materials that can be put in the hands of science and math teachers, and, interestingly enough, we just did the Science for Kids Web page at ARS, and it is in Espanol as well. So we have both. And the language arts teachers are now able to use that web page for English and Spanish, if they are teaching language, but at the same time getting into some of these areas that promote agriculture in terms of occupations, research, whatever that piece might be.

So we are moving ahead quickly with that particular agenda, and we anticipate that with the additional funds we would be able to move the curriculum materials development.

Another role that is critical is to serve as a broker, as a clearinghouse of these materials. We provide a lot of materials at USDA that could be of use to teachers in the school system, not only within our mission area but certainly across the board. So we contemplate being able to use these additional funds to move that part of the agenda forward.

Mrs. EMERSON. As you know, it is sad that this program has been level-funded for so many years.

Dr. GONZALEZ. A long time.

Mrs. EMERSON. And I was real pleased to see that you all had increased it in this year's budget and wondered precisely how you were going to use the increase in money. So I appreciate that.

Let me move on to another line of questioning, if I might.

Dr. GONZALEZ. Okay.

FOOD EMBARGOES

Mrs. EMERSON. And that has to do with food embargoes. We have all talked about that in the subcommittee. It is for our producers in southeast Missouri, and really across the country, an issue that is vital to their future. And, obviously, we also know that embargoes do nothing to hurt other countries as much as they hurt our own producers here at home.

You know, just as a case in point, I look at the country of Cuba, and specifically, back in 1962, Cuba was the number one export market for rice before the embargo. In 1989, Iraq was the number one export market for rice before the embargo. In 1995, Iran was the number one export market for rice before the embargo. I just think our rice producers—and I have probably the northernmost rice-producing district in the country that they deserve better than that.

USDA, more specifically the FAS, has produced an analysis that says food embargoes instituted by our Government cost farmers and ranchers about $500 million annually. Do you know if any of the four agencies in USDA's research mission area contributed to this analysis? Because it seems rather conservative compared to all the other studies that we have looked at.

Dr. GONZALEZ. Well, I am sure that we have had some interaction with FAS. I am going to ask Dr. Susan Offutt, our Administrator, if she could provide us with part of that response.

Mrs. EMERSON. Okay. I appreciate that.

Dr. OFFUTT. Good morning. We have worked over the years with FAS on the implications for trade of different measures taken in Iraq, and more recently, we were looking at Cuba but in a prospective way, what may happen.

The number may not be as big as you might anticipate because of the possibility of trade diversion; that is, we may not be selling into, say, Iraq but we may pick up a market that someone who takes our place in Iraq gives back. And so that tends to have a leavening effect on the estimate of losses to U.S. farmers.

Mrs. EMERSON. Okay. Have the four agencies at USDA been involved in any of this research?

Dr. OFFUTT. Yes, certainly over the years, ERS is quite involved in the study of the impacts of the embargo initially in the 1970s, and Cuba as well. So that would be carried out in the context of generally how we look at trade flows in the world.

Mrs. EMERSON. I guess the bottom line here is I am just trying to figure out how serious the USDA is in really determining how much this is costing our producers in potential losses and whether or not, your estimates are credible. And I am not questioning the basis for the research, but just in comparison to, say, U.S. Wheat Associates or even CRS and other research projects. I think that you all are just substantially below other estimates. And I know that our rice producers, for example, believe that Cuba alone is a

$100 million sales opportunity for rice, but yet you all are just saying that we are losing $500 million a year. So it is of serious concern to me, and I think all of us feel very strongly that we have got to do everything we possibly can to open those markets up.

I will save my next question for the next round, Mr. Chairman.

Mr. SKEEN. Mr. Boyd?

Mr. BOYD. Thank you, Mr. Chairman.

Dr. Gonzalez, I was interested in your comments in your testimony on page 5 about the initiative that you all are undertaking to produce—or provide EPA with some science-based information as they try to implement—or as we try to implement FQPA. And I noticed, the best way I can figure, you have an additional—you have $56 million for FQPA-related activities, which is an increase, significant increase over last year of $19 million.

Can you explain your role in providing this information to EPA and what it means for our producers? Also, how receptive or cooperative has EPA been in accepting the science-based information that your Department has provided so far?

FQPA IMPLEMENTATION

Dr. GONZALEZ. Yes, sir. Thank you for the question.

We have, as we interact with our colleagues at EPA, looked for ways of increasing our involvement from the standpoint of not only the research, for example—and I will use the case of methyl bromide as one, looking for the alternatives to that. Another is to look at the minor-use pesticides, if you will, for their impact as we transition out of some of our traditional pesticide practices. As we go through that process and EPA begins their deliberations, it is important that we provide the science and sound data to be used in decisionmaking rather than other data, or anecdotal kinds of things.

We have a number of these programs where we are not sort of single-line but several places where we have asked for increases in order to broaden the scope of what we are doing from a research effort. I think a critical part of that is the element of working with our universities and colleges that are doing research in their States because of the local impact that that would have.

The Deputy Secretary has been the person who has chaired that ongoing discussion with EPA. We have a number of folks at his level in his office that are working with us in developing this plan. We have had the meetings out in California, meetings in Florida, a number of places, in order to get information from the producer side of the community that we can also use in shaping our overall effort.

Mr. BOYD. From your perspective, then, has the interaction and the cooperation been good or—are we a little early in the process to determine yet how that information is going to be used? And do you have good cooperation with EPA in using that information?

There have been some accusations that the decisions up to this point on the part of EPA have been made based on assumptions which are not science-based, and we all support the additional funding to help you provide the science-based data so that good decisions can be made. And my questions are: Is our money going to

be well spent, and is it going to be ultimately useful to our producers and to the EPA? Are they going to be able to use it?

Dr. GONZALEZ. The question in terms of the discussions—I know that the Deputy has been very much involved in making sure that we sort of follow the science in order to make those decisions.

The reason why I hesitate, the answer to the question is that I don't know—we probably have made some decisions prior to having this evidence and some of the information that we are now providing. It is a matter of educating our partners in terms of the process that we need to follow. We did some of that legislation early on. We are going back to revisit what the implications might be of that, and how it will impact our producer community. Part of the effort beyond the research is to be sure that we have the dialogue and outreach effort and then education on the alternatives, to some of those pesticides. Another element of our efforts to help our companies that are moving forward to get new licenses and new materials approved and speed that process up as well, because as we are looking for alternatives, part of it will be a time factor in terms of making sure that we can do this early enough for our producers.

Mr. BOYD. I noticed that in the CSREES program level budget there were numerous, maybe seven or eight, programs that have a minimum amount of funding in your proposed budget or were not funded in the previous budget, everything from anti-hunger grants all the way to biobased products.

Are all these new initiatives, and is that going to stretch us thin? What is the idea? Are some of those we are already doing some work in that the amount is so minimal it doesn't even register on these millions of dollars scale that we use here?

FUNDING LEVELS

Dr. GONZALEZ. Well, your question from our perspective is one of great importance, as I look at budgets—and we have gone through these discussions with our advisory boards, the clients that we work with and that we serve in terms of the seriousness—and then look at budgets of other program areas in other departments, some of those requested increases are mostly double-digit in the millions.

Now, knowing that we have some limitations within our budget process, we would like to see some increases beyond what we have recommended. I think it would be natural for us to say if we are going to look at helping to alleviate hunger in our communities, if we are going to look at making sure that the result of the research in the biobased products area results in additional income at the farm level. The fact that we are getting continued support is tremendous. What kind of impact could we make in a shorter time frame if those dollars were more?

So I like the question. I don't know how we get to the point of actually increasing those into some of the double digits that I think are necessary.

Mr. BOYD. Thank you, Mr. Chairman. Mr. Chairman, I apologize. My light didn't go off over here, Mr. Chairman, and I see that one over there did. So this box over here on the corner is malfunctioning, just for your information. I apologize for going over. I

would like to continue the questioning on the next round. Thank you very much.

Mr. SKEEN. Mr. Latham?

Mr. LATHAM. Thank you, Mr. Chairman.

Miley, welcome.

Dr. GONZALEZ. Good morning.

Mr. LATHAM. Good to see you, a good Paullina, Iowa, farmer here again. That is great. I have got three hearings going on at the same time here, so I apologize for kind of jumping in and out.

Mr. SKEEN. It is a great world, isn't it?

Mr. LATHAM. It is a great world, yes. They are less important. Bill Richardson and Janet Reno are at the other two hearings. Miley is much more important.

Dr. GONZALEZ. Thank you.

Mr. LATHAM. Let's make that on the record perfectly clear.

[Laughter.]

RESEARCH TERMINATIONS

Mr. LATHAM. Anyway, I guess one ongoing budget item, your request contains termination of a soybean researcher at Iowa State, and I always wonder why the administration would request terminating this employee who has been there 12 years in the Plant Pathology Department, seven consecutive meritorious achievement citations from USDA, and we have to put him back every year. And I think it goes to the whole issue of any kind of continuity as far as research and also the feeling among a lot of researchers that they just as well go off to somewhere else because they can't depend on a job at USDA or through the normal process. Why is that?

Dr. GONZALEZ. Well, we asked ourselves some of those same questions. The question I think Mr. Boyd asked contains some of the same elements of discussion, that as we continue to look at new and emerging areas—and when you use the case of soybeans, when we look at the products that we have seen most recently, our diesel, the chain bar oil, fifth wheel grease, any number of those things—that we are going to forever be indebted to this research arena. We need to continue this research. Whether we couch those things under this new biobased area or not, it just seems that if it is new and emerging, we are able to garner support and get additional help. And my point earlier with another question was we need to maintain that baseline of research that will provide us those answers in the short run. And so I think we are on the same agenda.

Somewhere along the way we need to think about how we do some of these things differently in order to maintain that support. That is why I talked about the balanced portfolio, that some of this will come under our competitive side of the agenda, but the other has to be part of our ongoing effort both at USDA and out with our research community.

Mr. LATHAM. I would, I guess, ask: Was this part of your proposal to OMB, or did this come back from OMB?

Dr. GONZALEZ. My sense is, having given a broad range of recommendations for us to continue funding, as I indicated in my opening remarks, we had an increase of 7.7 percent for ARS and

then we had to offset that with some other areas—what are the highest priorities and how we go through that. So it is in that mix of recommendations that we made, and we asked for and tried to highlight those areas that we continue to think are important when we work with them.

NATIONAL ANIMAL DISEASE CENTER

Mr. LATHAM. Just for the record, too, Mr. Chairman, it was, what, $120 million in the rescission that I think to me is a real high priority, and we should look at that very closely as far as rescinding that money.

It is my understanding that USDA and Iowa State signed a letter of intent back in 1995 to secure funds for a shared BL-3 facility. Iowa State has $3 million ready to go for this item and will be willing to build a wing at the National Animal Disease Center. Apparently, there have been some problems in developing a final agreement between the university and the Department. Can you give me an update or status report on that?

Dr. GONZALEZ. Well, probably related to the entire discussion is we have gone through our own deliberations in terms of a master plan for updating and upgrading our facilities in Ames with the combination of our ARS research as well as APHIS. And so we have some long-term projections. You will see some numbers that we provided in our testimony, and I think it is that combination of getting our support for the beginning of that process and then being able to do that linkage that we have with Iowa State.

If you would like, we could provide additional information.

Mr. LATHAM. I would really like to know where we are.

Dr. GONZALEZ. I will ask Dr. Horn to give us an update.

Dr. HORN. As has been indicated, the joint proposal is actually one where APHIS and ARS have come together. There were prior to this two individual proposals that added up to an extraordinary amount of money, and the joint proposal is actually reflecting a savings of $71.5 million. The other advantage is that the original proposals would disrupt our activities at Ames for a period of about 20 years, and if the new proposal were funded, the construction would be completed in about 7 years.

We have requested, as you will see, about $9 million in this budget to begin the process. There needs to be some discussion as to whether or not that is ideal because normally the design costs are about 10 percent of the overall project. But given that this is a very significant construction program, the administration has expressed some concern to make sure we have got it right, to make sure that the estimates are correct and the like. So I think that is an ongoing dialogue.

Mr. LATHAM. Okay. Our red light over here works. I won't be able to stay, Mr. Chairman. I have got some questions that I would like to submit for the record.

Mr. SKEEN. If you would like to submit them, that is fine.

Mr. LATHAM. Thank you very much.

INITIATIVE FOR FUTURE AGRICULTURE AND FOOD SYSTEMS

Mr. SKEEN. Before we go any further, I would like to make this proposal. Let's step back and take a look at what the initiative for

future agriculture and food systems is all about. This initiative sets up a mandatory research program authorized at $120 million per year. It was done to avoid our Appropriations Committee, in my view. Of course, that is selfish.

One of the main problems our committee has faced over the years is the increasing share of Federal spending that goes to mandatory programs. Across the entire budget, two-thirds of all the spending is mandatory, and that comes to $1.2 trillion per year for such items as paying the interest on the national debt. In our bill alone, over 80 percent of all the spending in the current fiscal year is mandatory for such items as food stamps and school lunch. And we do not know what our subcommittee's allocation will be for the coming fiscal year, but I can assure you and everyone else that it will not be anywhere near enough to do everything that everybody wants to do. All of us on this subcommittee support research. The problem is this mandatory research eats up our available budget authority.

The choice is really very simple. We can either allow the mandatory program to proceed, or we can prevent that spending and apply those resources to congressional initiatives. In the past, we have prevented the spending, and I think we should continue to do so. If it is the will of the membership to go the other way, we could do that, but it will cost us dearly and there will be other things that we could not do.

With that wonderful statement, I will ask Mr. Farr if he has questions.

Mr. FARR. Mr. Chairman, I always have questions. Thank you very much.

Mr. SKEEN. Very well. We are always counting on you.

ALTERNATIVES TO METHYL BROMIDE

Mr. FARR. Thank you. I appreciate it.

Thank you for coming today. I was sitting here thinking this is, since I have been in Congress, the eighth appropriations process I have gone through, and I have been very interested in it because I think that the specialty crop interests of California are heavily influenced by the work that you do.

I have been concerned that we have been appropriating about $14 million a year to find alternatives to methyl bromide. If I add that up, that is over $100 million that we have spent in the last 8 years. We asked for a report of how that money was being spent, and to my knowledge, it has never been produced. We also put language in last year's budget saying that some of that research or a good part of it ought to be done in the field because the biggest problem I have with your agency is when you go to the farmers, they don't know what is going on. And I think that there is a growing disconnect between the science community and the people with their hands in the soil.

If we are going to have confidence within the farming community that the work of the research, the science side, is worth supporting, we are going to have to have better dialogue. This is always a battle, but in your area, particularly. I mean, in the drug area that we were talking about the other day, the drug companies put all that money into research because they get such a big payback for

it, but in agricultural research, I think the Government carries the burden.

The reason I would like to see more of your work done in the field. You know, it is like that old adage where it was asked, "why do you rob banks?" Because that is where the money is. Well, if we are going to have specialty crop research, we ought to go where the specialty crop research is done.

So my question is: Of this $100 million-plus that we have spent on methyl bromide, can we get a report on how that has been spent? And my understanding is the language that the committee put in last year's report saying that this money ought to be spent in the field where the problem is. We have gotten no feedback from that. A lot of the people in the field feel that it is not getting there, and these are people that have credibility, you know, like the California Strawberry Commission and the University of California at Davis. So I would like to ask for some feedback on the methyl bromide research and how it is going.

Also, I understand that members of your Department met last year in Monterey to discuss priorities for research with the research community, and the priorities that were identified were the application of technology to expand nursery research and expand weed control efficacy. Can you tell me how you are proceeding from that April meeting? What has been published or circulated and to what extent USDA ARS research has been modified to respond to the priorities?

RESEARCH PRIORITY SHIFTS

Mr. GONZALEZ. Yes, sir. Going back to your first couple of questions, we can come back and give you some detail in terms of that report of the work that we have been doing, and the point of the field studies I think is an important one. We have taken that into consideration and tried to move forward to make sure that not only our own USDA research effort—not only in this area, but in others—is carried out in partnership with the universities and colleges that are doing these research programs and in the private sector.

In addition to the meeting that we had in California, we had a session in Florida as a follow-up. Dr. Eileen Kennedy, who is my deputy, has been chairing those meetings. I am going to ask Dr. Horn in just a minute to talk a little bit about the effort in regard specifically to ARS.

Mr. FARR. The question is: Has the follow-up to those meetings been published or circulated? And have you shifted your priorities to address those?

Dr. GONZALEZ. We have shifted the priorities in those areas. I am not sure about the publishing. I know that it was an ongoing effort of a committee. So I will ask for some help from our agency to know where we are in that regard. But the implications of what you are describing not only for the producers in California but elsewhere, are important when we consider that on an international scale these questions of methyl bromide and its alternatives and the supportive research effort is part of a broader agenda. The fact that as we move at phasing out is certainly of importance and it will have some tremendous implications for our producer community when others in other parts of the world will continue for a cer-

tain length of time to be able to have methyl bromide at their disposal.

Mr. FARR. I understand all that. I think we need to talk more specifics.

Dr. GONZALEZ. Right. And I am going to ask Dr. Horn to help with that.

Dr. HORN. We will try to do that——

Mr. FARR. My time has expired, so this is on your time, Mr. Chairman.

Dr. HORN. The meetings which you are making reference to are stakeholder input meetings. The results of those sessions would have appeared in our methyl bromide newsletter, which in itself is a response to the need to try to get the information out and improve our communications with producers.

In addition to that, in the past 3 to 4 years, we have moved a significant amount of money to the field, and we now have $2.7 million in field studies that are actually selected by and managed by field producers. Most of that, if not all of that, is in Florida and California.

Mr. FARR. That is 2.7 out of the 14?

Dr. HORN. Yes. And we also have another $2 million.

Mr. FARR. Where does the rest of it go?

Dr. HORN. We have another $2 million in extramural funds with the universities in Florida and in California, and then we have an intramural research program that involves a very significant number of scientists that are working on these alternatives. Although we have a serious deadline which, thanks to the Congress, was extended from 2001 to 2005, this is one of the highest priorities we have in the agency. And we are communicating as best we can with as many groups and people as we can.

Mr. FARR. How often do you put out your newsletter?

Dr. HORN. Quarterly, I believe.

Mr. FARR. Quarterly methyl bromide newsletter?

Dr. HORN. Yes.

Mr. FARR. Can we get on the mailing list?

Dr. HORN. Absolutely, and we will give you the back issues.

Mr. FARR. Can we get farmers who are concerned on that mailing list?

Dr. HORN. Yes, we can. We provide this information to the Strawberry Commission so they could forward it to their members.

Mr. FARR. My time has expired. Thank you, Mr. Chairman.

Mr. SKEEN. Mr. Hinchey?

Mr. HINCHEY. Thank you very much, Mr. Chairman.

Mr. Secretary, first of all, I just want to say to you and through you to Secretary Glickman a hearty "well done" on the announcement yesterday of the new organic rules.

Dr. GONZALEZ. Thank you.

Mr. HINCHEY. I know that these rules have not yet been finalized and that there will be a continual review of what you have set forth over the period of weeks and months ahead. But this is a situation where the Agriculture Department came out with some recommendations sometime ago. They met with substantial opposition, and in the face of that, you did the wise and prudent thing. You withdrew, took another look at it, and now you have come

back with something that I think is much more acceptable to the American people and to the agricultural community.

Dr. GONZALEZ. Yes. Thank you very much.

Mr. HINCHEY. So I just want to congratulate the Department and the Secretary on that, and if you would convey my remarks to Secretary Glickman, I would be very appreciative.

Dr. GONZALEZ. Absolutely.

Mr. HINCHEY. The statement that Dr. Horn made noting that in 1997 only 2 percent of farms produced half of all agricultural sales is something that ought to set off a warning light for all of us, I think. It does for me because I am concerned about the increasing consolidation of agriculture in America.

Whenever I see that, for example, I am reminded of the dairy industry in New York and the fact that nationally we are increasingly moving to a point where we are going to have essentially two dairy farms in the country, and everyone else is going to be cut out, and people are going to be dependent for their agricultural products on farmers that are very remote, indeed. And I will just take this opportunity to note that I would like to see a change in the policy of the Department with regard to the Northeast dairy compact in New York and the opportunity of New York farmers to join that dairy compact and to work together more effectively so that they can get a fair price for their product that will allow them to continue to stay in business. That is good for them and I think it is good for consumers as well.

You also note in your testimony Dr. Gonzalez that there is $1 million in the budget to examine what is called the structural changes in the agriculture and food sectors. This is an initiative that will look at where these concentrations are occurring, which I think is very good.

I wonder if you can tell me some more about this initiative, how it is going to unfold, what you hope to learn, and what will be the benefits from it.

STRUCTURAL CHANGES IN AGRICULTURE

Dr. GONZALEZ. It is actually our Economic Research Service that has provided the leadership for us to move forward in that initiative. And as you have already indicated, it has been an issue of critical concern to a great many folks, certainly out in the small-farm community. We have some areas in our overall budget that will address some of that component.

But I would like to ask Dr. Offutt, our Administrator for Economic Research Service, who has really provided a lot of the leadership for us taking a look at the economic consequences and impacts of this structural change, looking at who is affected and in what ways, and what the broad spectrum of impact that that will have.

Dr. Offutt, if you would, please?

Mr. HINCHEY. And also, if you would, how the program that you are planning will help small farmers adjust to the structural changes that are taking place within the agricultural industry.

Dr. OFFUTT. Yes. This $1 million is intended to support really two new areas of research. One is it builds on a base which looks at this phenomenon of the increasing concentration at the production end of agriculture. But we need to extend that through the

marketing chain to understand how consolidation in upstream industries and downstream industries affects farmers' ability to bargain with input suppliers as well as to get a good price when they sell into wholesale or retail markets.

Mr. HINCHEY. The consolidation of the seed industry, for example.

Dr. OFFUTT. Yes. And to do that, we need to spend much more time understanding how consolidated firms work. They work by contracts and mechanisms that aren't familiar to many people in agriculture. That is one way we will help smaller and medium-size farmers learn how to do business. They won't necessarily be selling into spot markets. Those are volatile and the prices are probably lower.

To do that, though, we need to collect data on retail prices, which the Department typically has not done—has never done, because a lot of the changes are driven by consumer demand. We can't act as if they don't exist. So we are really trying to take—you know, it is trite to say it, but it is a systems perspective. It is not something that you can understand in isolation from changes in final demand. So I think that is going to give us a better understanding of what really causes changes in prices to farmers.

Mr. HINCHEY. I thank you very much for that. I just want to assert my bias at this particular moment. I believe that diversity in the agricultural industry is better for the industry and for consumers, and so I am hoping that what you are doing will contribute to stopping this trend and helping to reverse it.

Dr. GONZALEZ. Thank you.

Mr. SKEEN. Mr. Nethercutt.

Mr. NETHERCUTT. Thank you, Mr. Chairman. Welcome, gentlemen.

Dr. GONZALEZ. Good morning.

RISK MANAGEMENT EDUCATION

Mr. NETHERCUTT. I want to focus for a minute on the issue of risk management education. I think as farmers in our country go through the challenges of the day with respect to opening markets and seizing on opportunities that are going to be available for export sales or domestic sales, we need to focus better and more on educating farmers as to risk management. Would you agree?

Dr. GONZALEZ. Yes, I would.

Mr. NETHERCUTT. I am wondering what risk management education activities the Cooperative Extension has been involved in over the past 2 or 3 years?

Dr. GONZALEZ. Well, you know, I am delighted with the question. I said yes right away because it is one of those areas where, when we talk about the safety net for agriculture, we have developed a number of mechanisms and certainly risk management has been one of those. But critical to having new instruments—I happen to sit on the Federal Insurance Corporation group—is the actual implementation of the instrument, getting information on the instrument into the community so that they know how to use it to manage risk? As you look at the agenda from a research and education standpoint, risk management continues to grow, how our small and intermediate producers are able to respond to the changing sce-

nario, low market prices, or whatever it is, and then how much insurance to buy or what are the other elements of decisionmaking that are a part of that.

So we in extension have set out a couple of proposals, and I say "we." Now I am claiming—at one time I was an assistant dean for extension—so I am claiming that part. But we have set out some proposals for increasing the working relationship across the board. Last year, CSREES helped with the implementation of the risk management education program from RMA. So we assisted in that process at the Federal level. And then we are also looking at what interaction we have with those agencies out in the States that extension agents—we are in 3,150 counties—can work with. We have some level of production everywhere that we can continue to have a role in the educational process, outreach to the producer community, to make sure that they understand what these things are.

Mr. NETHERCUTT. I have legislation I have introduced, the Agricultural Risk Management Education Act. Have you had a chance to look at it?

Dr. GONZALEZ. I have not.

Mr. NETHERCUTT. Okay. It really focuses more on making sure that our farmers have a chance to learn about and effectively react to the whole risk management issue. And I am wondering if you can quantify how effective the administration's or the Department's proposal—or programs, I should say, have been to date. What sensitivity are you seeing in the agriculture community, the production agriculture community, and how do you quantify it? Do you give yourself an A, B, C, D, or something less?

Dr. GONZALEZ. Well, having been an old classroom teacher, I don't know about the grade, but if we are learning something, there may be some merit in the process.

Mr. NETHERCUTT. Right.

Dr. GONZALEZ. We have had those discussions internally in terms of how we as an educational entity are able to help with the mechanics of the process. We have met with RMA, and we have met with others, and certainly there are a number of folks that do this within our university community as well that I think have some expertise on how to make sure that we effectively implement those programs.

Beyond introducing new instruments for crop insurance—we did one for clams last summer and we are looking at new vegetables and others of our production areas—and so I don't know that we can quantify the effectiveness immediately. But certainly as we continue to work through CSREES, in our competitive grants area—I looked at the different budget areas where we are looking at risk management programs such as within ERS to do a better job of getting that quantification, being able to say this is where we are and this is where we can go.

Mr. NETHERCUTT. I understand, which brings me to, a point that I want to make to you that I think is maybe lost in the budget submission, the need and the importance of special grants. Special grants meet that risk management need that many farmers have as many issues affect a particular region disproportionately, maybe, also, a national issue that may face them in terms of the management of their risk, in terms of research that needs to be

done and is being done through the special grant programs. I think it is very valuable that we not diminish special programs and sort of nationalize agricultural research. I think we need to make sure we are clear on specific problems and specific areas that are worthy of the taxpayer dollars.

Dr. GONZALEZ. In terms of our SARE program, our Sustainable Ag Research and Extension Program, I think it is a model that is working at the grassroots level. We can bring any number of elements to bear in terms of our educational program in that regard. And so I very much appreciate the fact that this committee has given us additional funds in the past to continue to grow the effort under that SARE umbrella.

And if we can use that as a model when we have our initiatives for small farms, these are all part of that educational process that we need to include. So I thank you very much for that support.

Mr. NETHERCUTT. Thank you.

Thank you, Mr. Chairman.

Mr. SKEEN. Miss Kaptur.

Ms. KAPTUR. Thank you, Mr. Chairman.

I would like to ask two research questions, which Dr. Horn can think about while I am asking another question regarding CSREES to Dr. Gonzalez.

The two research questions are is there anywhere within the ARS system where you are working on transplants of tissue from plants or animals to humans? I know generally that is considered to be work that perhaps HHS would do under some contract. But I have been asked that question in my home community, particularly by pork producers who are very interested in raising animals that would be lab and operating room ready for transplant of that tissue into humans.

And my second question on the research side, I was recently in the nation of Hungary. Dr. Horn, I wish you were with me—they were really all biochemists and incredibly gifted people. And they asked me a question I could not answer relative to the relationship between the rising levels of allergies in the United States and the production of pollen from hybrids and other crops that we may be planting now and was I aware of any studies that connected the two. I have to be honest and say I was not aware of such studies, but I am wondering if any such studies are going on. We know that there are substantial increases in allergies in this country. And they basically said, "Do you know that you are all bathing in pollen every day, and are you aware of how that current pollen differs from prior pollen?" And I really could not answer their questions. So I would have those two research questions to ask.

But on the CSREES side, you are asking for $1.096 billion, an increase of $22 million. I know our land grants do a tremendous job, and I am very supportive of your efforts for them to extend their extension activities globally. I am not at all enamored with what I see AID or what I do not see AID doing in the area of agricultural assistance around the world, and I would prefer to see more of that being done by USDA, including CSREES.

But my question on CSREES is I have found many of the land grants absolutely resistant to working with non-land grant institutions. And I can give you an example of that right in my own dis-

trict, Doctor. We sit in the middle of the belt where woody plants and horticultural species are produced, bedding plants both for decorative and for food production purposes. And we had worked with Ohio State University to try to develop a germ plasm center where we could preserve some of these species, et cetera, and ask them to work with our regional universities around the State. And we do not have a campus-based system. Universities in the State of Ohio are all separate.

I am telling you the resistance to working with the growers who grow and the locally based University of Toledo which has its own biological center, its own professors who study plants and so forth, you would think we were involved in the second World War. And the end result of all of that was the only function that the land grant let the local people do was the grow-out, none of the science, only the grow-out, sort of the low-tech end.

I am wondering is there anything in the CSREES authorizing legislation that is creating this intransigence on the part of the land grants to involve other universities and professors around the States in which they are located?

COLLABORATION ACROSS RESEARCH AND EDUCATION INSTITUTIONS

Dr. GONZALEZ. I am happy to report that I think we are moving in the direction of getting that collaborative effort across the spectrum of educational institutions, not only 4-year land grant research universities and non-land grant universities but our community colleges and using our 406 programs, for example that is integrated. So we are integrating research, education and extension. For some time, we have done bits and pieces of that, but I think for the first time we have a mechanism to help us move in that direction.

The other part, I think, of the opportunity that we have as Federal agencies is changing things by example. The collaboration and the partnership of CSREES with ARS, ERS and NASS, in terms of the work that we are doing collectively to help those institutions—provides an example of our in-house effort. At the University of Mississippi, which is a nonland grant university, our ARS facility, our researchers are housed within the Pharmacology Department looking at the new uses of plants and their products.

So we are seeing examples of our moving into that area where the land grant and nonland grant institutions are working together. Texas Tech is another example where we have a presence, with ARS and some of our programs that we funded through CSREES. So I hope that we would have some time to share some other examples. But we are moving in the direction of making sure that our university and college community understands that the scenario for the 21st Century is one of partnerships and collaborations. Because we are not going to always be able to provide all of the funding for our research and science agenda from agriculture, we are going to need to be broader in terms of how we provide funding, as well as how we provide the mechanisms for this working relationship.

Ms. KAPTUR. I would just ask your administrators to take a look at States where you do not have a satellite campus-based system, mother campus to satellite campus, but rather independent univer-

sities and really maybe come back to me and take a look at those States and see how you can encourage these land grants to be more collegial in the way they work with these other institutions, particularly when those institutions are located in the areas where agriculture is occurring.

Dr. GONZALEZ. Exactly. If I may, the note that was handed to me, the Chairman made some comments earlier about the initiative. Planning and working through the issues with our community, really opened up the opportunity for many institutions, both colleges and universities of the land grant and nonland grant system, to be able to apply for those competitive grants and really amplify the model that I was describing earlier.

So we have those things in motion. At some point, we would be able to provide some information for you. It is a great point. We want to be able to continue that because we see that as the future for our research and education extension community.

Ms. KAPTUR. Thank you, Mr. Chairman. I think Dr. Horn may have a quick answer for me on those two research topics. [Laughter.]

Dr. HORN. No and no. [Laughter.]

We are doing no research that would enhance opportunities to transfer either animal or plant tissues into humans. The closest thing that one might consider is a study using tobacco as a model to develop vaccines for the future. But should that prove successful, it would be subjected to all of the tests in the world through FDA and everyone else to make sure that it was completely safe. It is a new and novel approach to the development of vaccines to diseases that we may not even know about.

The other question related to allergies, and we do not have any program currently on allergies. Historically, those involved in agriculture, and in particular, those workers harvesting seeds, have over time become allergy prone and had serious problems and have had to leave those jobs. That has nothing to do with the new varieties or releases. This is a hazard of that kind of work.

The National Institutes of Health have a considerable effort with respect to allergies. Actually, that is a very good question and probably one that should be considered, but perhaps by them. We cannot do human work.

[CLERK'S NOTE: Additional clarifying information provided by ARS follows:]

IMPLICATIONS OF ATMOSPHERIC CARBON DIOXIDE ON ALLERGIES

ARS GLOBAL CHANGE RESEARCH

Although we are not conducting research on pollen from genetically-modified organisms as a source of allergens, we do in fact have research ongoing as part of our global change research program that relates increased levels of carbon dioxide to increased allergies. Increases in atmospheric carbon dioxide concentrations are well-documented and impact global change.

The Centers for Disease Control have reported a marked increase in the percentage of allergies and asthma sufferers among the general population. Recent ARS research has shown the impact of rising concentrations of atmospheric carbon dioxide on the pollen produced by ragweed, an important cause of allergies for many people.

What makes this research particularly notable is that it shows how increases in carbon dioxide concentrations that have occurred already increase pollen production, not just that future concentrations may make matters worse.

ARS scientists grew ragweed at carbon dioxide concentrations that existed 100 years ago, current levels, and a concentration projected for late in the 21st Century. Compared to plants grown in a carbon dioxide environment typical of 1900, current levels of carbon dioxide more than doubled ragweed pollen production. The projection for the late 21st Century is more than four times the pollen production in 1900.

Interestingly, the rise in reported allegies is consistent with a carbon dioxide-induced increase in potential ragweed pollen production over the last 40 years.

This ARS research is the first to report a direct effect of rising carbon dioxide concentrations on human health. Current work in ARS' research program on global change, including increased carbon dioxide and changes in temperature and precipitation patterns, may reveal other important implications for public health.

Ms. KAPTUR. Thank you.

Thank you, Mr. Chairman.

Mr. SKEEN. Thank you.

Mrs. Emerson?

CLIMATE CHANGE

Mrs. EMERSON. Dr. Gonzalez, actually I need your clarification on a couple of things that I am just a little bit confused about. They have specifically to do with the Global Change Research Program and the Climate Change Technology Initiative. The Climate Change Technology Initiative is a little bit more clear, and I commend the Agency for a lot of the work that you do with bio products and the Bio Energy Initiative. On the one hand, in your all's budget, there is money set aside for research into alternative energy sources, which I applaud. But then all of a sudden I come over to the part of the budget that talks about Climate Change Technology Initiative.

Is that something separate and apart from the bio-based projects and the Bio Energy Initiative or is this all part of one pot?

Dr. GONZALEZ. Part of the confusion may come from the fact that we have taken our budget recommendations, and we have put them under those categories. So we have used our five goals, and then we have listed things that might look like they are across the board.

In the case of the work that we are doing in global climate change and carbon sequestration and so on, there are some economic studies that I think are fundamental and important for us to be doing. There are those other areas of research where we are also working, ARS research, for example. So there may be some overlap in terms of the topics, but they are separate in terms of the specific requests for those areas of endeavor.

When you look at the volunteer process that farmers are going through to use conservation tillage, any number of other mechanisms and strategies to make sure that we are producing in an environmentally friendly way, we have those elements. I do not know if you have the same material that I have. Under global change, we have the research program, the national assessment, new information for carbon cycle initiative, which is the $4,700,000, and mitigating climate change impacts, those are all different parts of that broad agenda on global change. Some of it is ERS, ARS and CSREES and some of it is working with other agencies.

Mrs. EMERSON. Do you think that the issue merits a 60-percent increase in your budget, particularly when we have got other programs that are being cut? And I realize that for the long-term future, perhaps, this might be something to take a look at. But our

farmers are hurting so badly right now, I get a little bit nervous when we are redirecting that much money towards something that may or may not, in the future, be important. And I am not saying we should not be doing the research. I just worry about other things that have a more immediate impact, not the least of which is to put money in our farmer's hands right now.

Dr. GONZALEZ. We will be able to provide you with additional information. But one large portion of that is under the CSREES umbrella, and that is our linkage directly out there to our producer community, in terms of getting application. It is not unlike the question that was asked earlier on risk management: How do we get the tools of the technology and so on into the field, if you will, the field studies that Mr. Farr talked about earlier. So that is really part of, and I do not have the detail in my notes here, but it is part of the effort to really get funding out to the universities and partners to move this agenda forward.

Mrs. EMERSON. Do you have any idea how much of these funds are devoted toward the national assessment portion of your activities?

Dr. GONZALEZ. It is $800,000 under our ARS request for the Global Change Research Program national assessment.

Mrs. EMERSON. Can you provide for me, you do not have to do it now, what those activities are going to be and outline them for me.

Dr. GONZALEZ. We will, certainly.

[The Information follows:]

U.S. GLOBAL CHANGE RESEARCH PROGRAM (USGCRP) NATIONAL ASSESSMENTS ACTIVITIES FY 2001 PROPOSED INCREASE OF $800,000

The current National Assessment is providing valuable information on the regional and sectoral differences in adapting to climate change and variability and identifying research needs. FY 2001 assessment activities will focus on completing the first national assessment and on continued efforts to involve USDA stakeholders in helping identify risks and opportunities, and make data, research, and information available to better understand the implications of global change on agricultural systems.

Assessments and related research play an integrative role across the USGCRP areas. Assessments assemble and synthesize scientific results, help increase interaction among scientists and the public, and aid in identifying gaps in knowledge. Assessments are increasingly viewed as important vehicles for disseminating information to public policy and decisionmaking communities. the current National Assessment of the consequences of climate variability and change for the Nation marks a milestone in the evolution of the Global Change Research Program. An assessment of global change impacts on the agriculture sector of natural resources and the economy is an integral part of the overall national assessment and is nearing completion. An important aspect of the assessment is that it demonstrates a new public-private partnership that links research to the needs of stakeholders by providing managers, policymakers, and the public with information needed to increase resilience to climate variability and cope with climate change.

Mrs. EMERSON. That would be super. And can I ask you were these increases in your budget your increases or was OMB involved in making those decisions?

Dr. GONZALEZ. We have this partnership.

Mrs. EMERSON. Everyone has a partnership, it seems, with OMB.

Dr. GONZALEZ. I apologize for the facetiousness, but one of the things that happens is, beyond the things that we are doing within the mission area is that we have other of the agencies in the De-

partment that are also weighing in in our broader request. So the answer is yes.

Mrs. EMERSON. And no?

Dr. GONZALEZ. And no. [Laughter.]

We will get you the information.

Mrs. EMERSON. I would really be very grateful. And just also if you wouldn't mind providing for the hearing record a table showing how the agencies within the Department have been divided, as far as research goes, on both of these initiatives, I would be grateful.

Dr. GONZALEZ. We can do that. In fact, that is what I am looking at now is a table that has those by items by agency within the mission area.

[The information follows:]

Climate Change Technology Initiative and Global Change Research Program
(Dollars in Thousands)

	Program Type	1999 Actual	2000 Estimate	2001 Budget	Change From 2000
	Climate Change Technology Initiative				
ARS	Biomass for Energy	0	0	4,500	4,500
	Agricultural Industry Practices	0	0	4,000	4,000
FS	Biomass for Energy	0	0	9,500	9,500
	Carbon Sequestration	0	0	3,000	3,000
NRCS	Climate Change Technology (CTA)	0	0	3,000	3,000
	Total, CCTI	0	0	24,000	24,000
	Global Change Research Program				
ARS	Methyl Bromide	14,380	14,380	16,000	1,620
	Regions/Sectoral Assessment	0	0	800	800
	Agriculture and Rangeland Global Change	11,400	12,300	12,300	0
	Carbon Cycle Science Initiative	0	0	4,700	4,700
	Alaskan Agro-Ecosystems	0	0	400	400
	Mitigating Climate Change Impacts on Food Avail.	0	0	2,000	2,000
	Total, ARS	25,780	26,680	36,200	9,520
CSREES	UV-B Monitoring	1,000	1,000	1,567	567
	Improved Response Models (NRI)	6,400	6,400	11,900	5,500
	Total, CSREES	7,400	7,400	13,467	6,067
ERS	Economics of GC and Agriculture	800	800	800	0
	Economic Incentives: Carbon Sequestration	0	0	700	700
	Total, ERS	800	800	1,500	700
NRCS	Soil Carbon Studies (CTA)	1,200	1,200	1,500	300
	Soil Surveys and Inventories	0	0	12,000	12,000
	Total, NRCS	1,200	1,200	13,500	12,300
FS	Global Change Research	16,900	16,900	16,900	0
	Carbon Cycle Science Initiative	0	0	3,000	3,000
	Total, FS	16,900	16,900	19,900	3,000
	Total, GCRP	52,080	52,980	84,567	31,587

Mrs. EMERSON. Excellent. Thanks.
Mr. SKEEN. Mr. Farr?

METHYL BROMIDE

Mr. FARR. Thank you, Mr. Chairman. Let me follow up on the methyl bromide. What I would like to have is a report from you on the total amount spent on methyl bromide research, how much of that was spent for crop research versus structural research over the last whatever years you've been spending it.

And I want to follow up on another issue. Last year, Congress appropriated an additional $2 million in the integrated account to support farm research to be disbursed through grants to both academic institutions and to commodity groups. And I understand that since that appropriation, you have not even made a call for proposal. This research was, you know, its timing is critical. Do you know when you are going to make the calls for proposal and have you developed a criteria for evaluating those calls? And then the bottom line is when will the funding be ready?

Dr. GONZALEZ. Good question. I am going to ask Dr. Laughlin to come up and get his feet wet in answering your question, since this is his first opportunity. But before I forget, we do have some of the materials that I had brought along on our methyl bromide assessment on the phase-out that Economic Research Service has provided, and we will share those, and then I will turn to Dr. Laughlin to help me with that response.

Dr. LAUGHLIN. Mr. Farr, the three RFPs, as they relate to water quality, food safety and pest management, are projected to be in the Federal Register about March 31st.

Mr. FARR. March 31st. So that makes the call for proposal?

Dr. LAUGHLIN. As soon as that is in the Federal Register, that would be the call for proposal.

Mr. FARR. And then what is the time frame after the——

Dr. LAUGHLIN. Probably about two months to prepare that per the proposal, to have them in, and then they will be peer reviewed, and we will move it as fast as we can.

Mr. FARR. And then what does that mean? When is the decision made for grant funding?

Dr. LAUGHLIN. If they are in—let us see, mid-July.

Mr. FARR. Mid-July?

Dr. LAUGHLIN. That is what I would anticipate.

Mr. FARR. Thank you.

Dr. LAUGHLIN. Thank you, sir.

Mr. FARR. I also understand that you are developing a proposal to investigate the potential of propargyl bromide. Is that pronounced right?

PROPARGYL BROMIDE

Dr. GONZALEZ. I think it is—I had it down. I had asked the very same question—propargyl bromide.

Mr. FARR. Propargyl bromide?

Dr. GONZALEZ. Yes, sir.

Mr. FARR. Do you know how that investigation is dealing with the priorities identified in the meeting in Monterey last April, where the registration prospects in California are much different

than the Federal prospect? I mean, it is much more difficult in California, and yet that is where most of the fumigant is used. So is the Department working on those issues and have you communicated with the industry in identifying this as a research priority for ARS? And are you moving people away from other things to put them onto this research?

Dr. GONZALEZ. I am going to ask Dr. Horn to give me some help with a response to that. When you first started out, I thought I could answer that, but as you got into more detail, I think it would serve us all well if he would help us with that response.

Dr. HORN. In recent weeks we have requested that $800,000 be made available from the CCC for this priority need. These funds cannot normally be used for research, but in this particular case it is much like an IR-4 program in that propargyl bromide is apparently an effective alternative to methyl bromide, but one for which the data are not available to EPA to make a judgment as to whether or not it could be labeled for the crops that currently use methyl bromide. We also have similar activities with Telone and metam sodium in preplant conditions.

Mr. FARR. I guess the keyness of my question goes to when you work out those EPA protocols, are you also taking into consideration the California standards?

Dr. HORN. Yes. The group that works with this set of issues would involve the California Department of Agriculture. In fact, it was done in cooperation with California, EPA, growers and scientists. Now, the scientists were briefly under the impression that this money could be used for other needs. However, this money, because it came from CCC, cannot be used for the other things that were listed as priorities for consideration.

Mr. FARR. So you carved out money outside of the alternative for methyl bromide or methyl bromide research. You have carved out a separate $800,000 to essentially qualify the registration of——

Dr. HORN. These funds, if approved, would be used to provide the data necessary to allow EPA to make that determination.

Mr. FARR. What is the time frame for that. When is the bottom line?

Dr. HORN. Well, it is, like everything else in methyl bromide, as soon as possible. But my guess is at least one season and probably two.

Mr. FARR. Two years? Two seasons?

Dr. HORN. Two growing seasons.

Mr. FARR. Two growing. Well, we do three in Monterey, maybe four. [Laughter.]

Dr. GONZALEZ. That will cut it down.

Mr. FARR. That is next week.

Dr. HORN. Time is short, and the water is rising.

Mr. FARR. Pardon me?

Dr. HORN. I said——

Mr. FARR. What is your season? How long a period are you talking about?

Dr. HORN. It can be called years.

Mr. FARR. Years. So two years. [Laughter.]

Dr. HORN. However, actually, much of this is used in greenhouses. I am not sure about this particular compound, but many

of these chemicals are useful in greenhouses as well. So it is not necessarily three years.

Mr. FARR. And the research with the methyl bromide money continues for other types of methodologies?

Dr. HORN. Yes Sir.

Mr. FARR. Okay. I appreciate it. This is clarifying. Perhaps we might need to get it written up a little bit more. I would like to send this out to people because this question is coming up a lot.

Dr. HORN. But this money could not be used for other research purposes.

Mr. FARR. Okay. Thank you.

Thank you, Mr. Chairman.

Mr. SKEEN. Mr. Hinchey?

Dr. HINCHEY. Thank you very much, Mr. Chairman.

I would just like to follow up with Dr. Offutt, if I may on a subject we were on a moment ago. In the present fiscal year, some $4.7 million was provided to the Secretary for mandatory price reporting. I am wondering if you requested any of that; if so, did you receive it? And if you received it, how did you use it?

MANDATORY PRICE REPORTING

Dr. OFFUTT. We did not request it, we did not receive it. We think to do the part of mandatory livestock price reporting that falls to us, which has to do with the collection of retail price data, will require an outlay of $3- to $500,000 and then our staff would work on analyzing it.

Our aspect of this project requires data on meat products, which are random weights, so they are not just scanned with that little graph. It has to be collected separately. We have to collect cuts. And unfortunately we have just learned that the company that used to do that is no longer in the business. So we are, at this moment, we are unfunded, but at this moment we are also not sure how to—we need to find someone to do this job.

Mr. HINCHEY. Do you know if any of that $4.7 million was used?

Dr. OFFUTT. None of it was used for that purpose, not by ERS.

Mr. HINCHEY. Not by ERS. Was it used by anyone else in the Agency?

Dr. OFFUTT. You probably know, Steve.

Mr. DEWHURST. The money, that $4.7 million was the Department's estimate of what it would cost the Agricultural Marketing Service to implement the main mandatory price reporting program, and that money was allocated to the Agricultural Marketing Service this year to get that program going.

Mr. HINCHEY. Okay. So that that is what it is being used for at the moment.

Mr. DEWHURST. Yes, sir.

Mr. HINCHEY. With regard to the mergers in the agribusiness industry, I know that the FTC and Justice Department are doing some investigations. Are you cooperating with them?

Dr. OFFUTT. Yes, we do.

Mr. HINCHEY. You do cooperate with them and that work is ongoing. Do you have any particular resources to carry out those activities?

Dr. OFFUTT. No. The kinds of questions they ask fit well with our ongoing research program; for example, on railroad consolidation, looking at the retail sector, as well as some of the work on slaughterhouses, and the recent one, the Cargill merger. So we tend to be able to take the work we are doing for other reasons and help answer their questions.

CROP INSURANCE FOR SPECIALTY CROPS

Mr. HINCHEY. Thank you very much.

I had a question as a follow up on the question that was asked previously with regard to crop insurance. The crop insurance program has within it certain benefits and certain deficiencies. The deficiencies that I find particularly troubling are with the program's treatment of so-called specialty crops: vegetables, fruits, silvaculture, things of that nature. I am wondering if we can anticipate any recommendations or any activities in the Department which will reform the crop insurance program in a way that will make it more applicable and more useful to the growers of those kinds of specialty crops.

Dr. GONZALEZ. It has been part of our discussions when we meet with the board and also with our Agency. We have grown the programs in some of those areas that you are indicating. When I was down in Florida I mentioned to the group that we were looking at minor crops, and they said, "Well, these are our major crops for us." And it deals with more than just the insurance component. Some of the other research that we are doing is to make sure that we have taken into consideration other issues as we talk about the organic rule and the implications of that rule. So these things are broad based, and it is part of our discussion and consideration when we look at these new instruments.

Mr. HINCHEY. Dr. Gonzalez, are there any changes that we might anticipate with regard to the crop insurance program which will make its efficacy of greater value to the growers of these specialty crops; again, vegetables, fruits, silvaculture, things of that nature?

Dr. GONZALEZ. It has been a primary focus of the discussions, I know, within the Agency, within RMA, but I could not tell you the detail of where we are right now. I would certainly be happy to—yes, Susan just reminded me we do the feasibility studies in these areas with ERS.

Mr. HINCHEY. Well, I appreciate that, and I appreciate your inability to respond to that kind of question just off the top of your head.

But if you would be kind enough to provide me with some additional substantive and detailed information in that regard with the area of what you are anticipating, what initiatives you may be contemplating, what are being put into effect, if any, and how you are moving in this particular area, generally.

Dr. GONZALEZ. We would be pleased to do that.

[The information follows:]

ERS has conducted about 45 feasibility studies (ranging from 20–100 pages each) for RMA investigating market and insurability issues for crops ranging from mangoes and cherries to rangeland. RMA is now insuring or in the process of insuring 20 of these crops (see list below), and used the ERS reports as the basis for determining insurability, obtaining industry contacts, acquiring knowledge of the markets, etc. These reports were done between 1993–1998.

There are 17 specialty crops that have been implemented to date (e.g., have been available to producers in pilot areas for at least 1 year). In addition, there are 3 that are pending FCIC board approval for 2001 (the board has never denied any requests—so far at least) and 8 pending board approval for 2002.

The 17 insured specialty crops that are already "in the field" include: 1) aquaculture (clams); 2) avocado; 3) blueberries; 4) cabbage; 5) crambe; 6) cucumber; 7) millet; 8) mint; 9) nursery; 10) snapbeans; 11) squash/pumpkins; 12) strawberries; 13) sweet cherries; 14) sweet potatoes; 15) tart cherries; 16) watermelon; and 17) wild rice. Three crops for which policies are pending for 2001 plantings are: 1) forage seed; 2) raspberries; and 3) blackberries. The policies pending for 2002 include: 1) a California fresh veg. policy (including cauliflower, broccoli, carrots, celery, and lettuce; 2) spinach; 3) cut flowers/ greens; and 4) tropical fruits and trees.

ERS also provided input into the structuring of the new "Adjusted Gross Revenue" (AGR) program, which is based on a producer's Schedule F and is designed to provide assistance to specialty crop growers who have multiple crops and do not find the single-crop insurance programs so attractive. AGR was first offered this past year. ERS continues to be asked for input on specialty crop insurance as issues arise.

Mr. HINCHEY. Thank you very much.

Mr. SKEEN. Ms. Kaptur?

SCREWWORM FACILITY IN MEXICO

Ms. KAPTUR. Thank you, Mr. Chairman.

I wanted to ask Dr. Gonzalez, we have had other under secretaries before us, and I have raised the issue of the closure of the screwworm facility in Chiapas, Mexico, which is a very important facility, and it is being moved south, as you probably know. But from the foreign policy side and just trying to be a good neighbor, I have been encouraging the secretaries who have appeared before us to think about an initiative that we as a country might adopt in partnership with interests in Chiapas and with your major reach in research, and particularly perhaps related to tropical production.

I would just beg of you to think about some initiative that we could incorporate in this year's budget that could transform the livelihoods of some of those people that live in that region. The facility itself employs, I think, about 600 people. I do not know where it is now, whether it is diminished down to 400 or whatever. And I think that USDA's intent is just to close it. I do not agree with that. I am glad we are moving the screwworm facility south, but I think that we ought to keep our toe in there, and we ought to help people deal with the major issue of the unrest there, at least one of the major issues, which is the lack of income. And there ought to be crops that we cannot produce in this country that would make sense.

You have got an international agriculture initiative included in your budget this year, and I would really encourage you to look at that. We have already got some presence. We have got some know-how.

Dr. GONZALEZ. Absolutely.

Ms. KAPTUR. And I would greatly appreciate your recommendation there.

RESEARCH WITH MEXICO

Dr. GONZALEZ. Thank you. Just as additional information, we have worked on our U.S.-Mexico Foundation for Science effort that Congressman Brown had helped us to initiate. And so there are a number of these things that are ongoing that I think is tremen-

dously important to the globalization of our programs. I visited a couple of our facilities down there. And I know that, Dr. Horn has been very involved.

Ms. KAPTUR. This one is not a pretty one.

Dr. GONZALEZ. Yes. And we have also had quite a bit of discussion through our land grant and other partners of, especially as you look at border issues, some of the other research that we are doing on both sides of the border. And so there are some elements that are in place that will help us move in that direction, and we would be pleased to consider how we do that.

Ms. KAPTUR. All right. I thank you, and I would hope that you would identify crops that would not compete with U.S. production, but in areas like coffee, and pineapples and so forth. You know, there is something to be considered there in the tropical arena.

I know that several countries have an interest in trying to create an extension-like system to reach down to their farmers. For example, there are burgeoning efforts in Ukraine and Russia. There was an initiative, in fact, by a university called Seratov University just outside Moscow to link to our land grant—Ohio State. That initiative was turned down. I really do not understand. It was probably turned down because there was not any money. I do not really know. But there was an effort to link the entire U.S. extension system to a country that desperately needs to be able to bridge their infrastructure. They do not have roads, they do not have telephone systems down in those villages. They are going to put a satellite dish on the Seratov Campus and translate extension information and make it available to farmers.

I am just wondering are you aware of these efforts to try to develop extension, using our land grant know-how, into some of these countries where food production is really essential to their future?

GLOBALIZATION OF AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION

Dr. GONZALEZ. Yes. Well, again, adding to our global component, our Federal level of involvement has been longstanding. We have had a number of things in Poland and Ukraine and other countries of the new independent states. Extension has been really fundamental to help move forward with some of those new economies, and we are continuing that again within CSREES. The university community has been instrumental in helping us to get extension agents from the local county level out and involved in those areas, whether it is on issues of water quality, or production, all elements of that agenda. So we have an ongoing activity through CSREES.

And then, of course, in the research arena, as you well know, we have our four labs in France, Argentina, Australia, China that continue to help us move this agenda forward. And our linkage to the international research centers is vital. One of the fundamental new areas of endeavor, I think will be the extension component of getting that research knowledge out to the local level.

So we are involved in that, and we would be happy to share with you. Dr. Hiram Larew in CSREES is the person who has been involved with that. He came over to work with us from USAID.—Mike McGuire and other folks in CSREES have quite a bit of experience. And we really rely on the university community and our

county agents at all levels, whether it is food, and our domestic agenda, home economics, or youth. I think that is another part of this. When you were talking about Mexico and Chiapas, those elements of what extension does for involvement in local communities would help to eliminate some of those other social things that often occur.

Ms. KAPTUR. I would be very interested, Doctor, in knowing the reason for the rejection of that Seratov University proposal, whether it was because of lack of money. Would this newly authorized initiative here or newly appropriated initiative, if we are able to fund it, would it help efforts like that? Because it seemed to me to be exactly a home run if you were trying to extend extension activities elsewhere.

Dr. GONZALEZ. And we will look into that and see.

[Additional information:]

The agency is not aware of this proposal. The agency does not have a record that such a proposal was received.

Ms. KAPTUR. All right. I thank you.

And thank you, Mr. Chairman and members, very much.

Mr. SKEEN. I think we are about to come to the conclusion. It is about six minutes before lunchtime. But since you mentioned the screwworm, I have lost my appetite for rice.

[Laughter.]

Mr. SKEEN. I have doctored more screwworm situations than anybody else that I know of. The eradication program has been one of the greatest programs——

Dr. GONZALEZ. Absolutely.

Mr. SKEEN. What they are doing now is moving the laboratory to Panama, which was the original idea, because then you can control the screwworm situation, in both the southern and northern continents. It has been a tremendously successful program. And I know there have been some tough situations in Mexico. So we have already picked out a new place in Panama for the building of this facility and keeping it up so that they can handle the southern hemisphere as well.

On that note, I hope I have not spoiled anybody else's lunch. [Laughter.]

Mr. SKEEN. I want to thank you very much.

Dr. GONZALEZ. Thank you, Mr. Chairman.

Mr. SKEEN. The presentation by your group, yourself, is always professional, and we are very pleased with you.

Dr. GONZALEZ. Thank you.

Mr. SKEEN. [Spanish.]

Dr. GONZALEZ. [Spanish.]

Mr. SKEEN. [Spanish.] We are adjourned.

[The following questions were submitted to be answered for the record:]

Agricultural Research Service

QUESTIONS SUBMITTED BY MR. SKEEN

MANAGEMENT COSTS

Mr. Skeen: Please update the tables that appear on pages 564 through 566 of last year's hearing record that shows funding and staffing levels other than scientists, required to manage your research program.

Response: The following updates the tables that appear on pages 564 and 566 of last year's hearing record that shows funding and staff years other than scientists, required to manage our research program. The table reflecting positions at the location level are multifunctional, providing services across the administrative function assignment areas.

[The information follows:]

Washington, DC Area: (Headquarters)

	FY 2000	
FUNCTION	STAFF YEARS	FUNDING
Research Direction	130	$14,758,771
Management	77	23,117,564
Personnel	123	8,518,628
Financial	34	2,315,356
Contracting	28	2,151,722
Facilities	37	3,236,326
Computer	41	3,428,093
Total	470	$57,526,460

Outside Washington, DC Area: (Area Offices)

	FY 2000	
FUNCTION	STAFF YEARS	FUNDING
Research Direction	64	$ 5,548,496
Management	23	1,458,469
Personnel	9	619,893
Financial	48	2,958,163
Contracting	46	2,951,242
Facilities	36	2,308,383
Computer	23	1,471,296
Total	249	$17,315,942

Locations:

FY 2000 LOCATION ADMINISTRATIVE SUPPORT		
LOCATION	STAFF YEARS	FUNDING
AUBURN, AL	3.0	$128,800
PHOENIX, AZ	5.0	242,700
TUCSON, AZ	2.9	142,000
DAVIS, CA	4.0	191,300
FRESNO, CA	4.0	190,100
PARLIER, CA	1.0	44,000

RIVERSIDE, CA	2.0	88,200
SALINAS, CA	3.0	115,700
AKRON, CO	2.0	76,500
FORT COLLINS, CO	.6	14,700
BROOKSVILLE, FL	1.0	38,400
FT PIERCE, FL	5.0	268,600
GAINESVILLE, FL	8.1	343,600
LEESBURG, FL	1.0	42,700
ATHENS, GA	6.0	264,000
TIFTON, GA	8.5	472,500
HILO, HI	5.0	227,800
HONOLULU, HI	1.0	54,500
AMES, IA	16.8	755,300
ABERDEEN, ID	1.0	52,300
BOISE, ID	4.0	200,100
DUBOIS, ID	1.0	65,000
KIMBERLY, ID	7.0	382,500
URBANA, IL	1.0	52,300
W.LAFAYETTE, IN	2.0	69,800
MANHATTAN, KS	3.5	165,500
BATON ROUGE, LA	2.3	91,500
NEW ORLEANS, LA	18.7	878,100
BELTSVILLE, MD	1.0	26,500
EAST LANSING, MI	3.0	135,400
ST PAUL, MN	3.0	156,600
COLUMBIA, MO	2.0	92,100
COURTLAND, MS	1.0	37,300
MS STATE, MS	7.0	326,000
OXFORD, MS	4.0	153,200
STONEVILLE, MS	7.5	320,800
MILES CITY, MT	5.0	244,700
SIDNEY, MT	5.0	219,400
RALEIGH, NC	2.4	118,300
FARGO, ND	6.0	281,700

GRAND FORKS, ND	14.0	691,500
LINCOLN, NE	3.4	130,400
LAS CRUCES, NM	2.0	66,200
ITHACA, NY	3.0	142,100
WOOSTER, OH	3.0	136,300
EL RENO, OK	8.5	315,400
LANE, OK	2.0	94,800
STILLWATER, OK	4.3	190,100
CORVALLIS, OR	6.5	284,600
STATE COLLEGE, PA	2.0	100,600
MAYAGUEZ, PR	4.0	166,500
CHARLESTON, SC	4.3	185,100
BROOKINGS, SD	1.0	40,600
BUSHLAND, TX	2.0	87,800
COLLEGE STA., TX	3.0	149,400
KERRVILLE, TX	4.0	164,600
LUBBOCK, TX	8.1	303,600
TEMPLE, TX	2.0	90,300
WESLACO, TX	12.0	617,500
LOGAN, UT	3.0	132,500
PROSSER, WA	2.0	101,000
PULLMAN, WA	5.1	213,500
WAPATO, WA	2.0	81,300
WENATCHEE, WA	1.0	52,300
MADISON, WI	3.0	140,100
KEARNEYSVILLE,WV	6.0	311,500
CHEYENNE, WY	1.0	43,900
LARAMIE, WY	2.5	106,200
TOTAL	282.0	$12,910,200

OFFICE OF PEST MANAGEMENT POLICY

Mr. Skeen: Please update the Committee on the fiscal years 1999, 2000 and 2001 expenditures and staffing support for the Office of Pest Management, established in 1997. What are your specific needs for fiscal years 2000 and 2001?

Response: The funding and staffing support provided to the Office of Pest Management Policy (OPMP) totals $1,089,554 for support of seven employees in fiscal year 1999; $1,103,731 for support of ten employees for fiscal year 2000; and $2,603,731 for support of sixteen employees in fiscal year 2001. Additional funds are requested for fiscal year 2001 to initiate, support, and oversee Regional Pest Management Centers and for supporting transitional strategies to alternative lower risk pest management systems and tools.

OPMP staff work directly with EPA to involve USDA experts, land-grant institutions, and growers in the pesticide risk assessment and risk mitigation processes. Involvement of these agricultural resources insures that EPA decisions are based on real-world data and information on agricultural practices. Additional funding is required to support grower outreach and the development of crop-specific pest management strategic plans. The planning process is of critical importance to agricultural producers and to insuring that ongoing research, new product registration, education, and training programs are responsive to grower needs and to the demands of the Food Quality Protection Act.

RESEARCH PROJECT TERMINATIONS

Mr. Skeen: For the record, would you provide a list of every proposed research project termination shown in the budget justification, showing what the fiscal years 1999 and 2000 spending levels are, and list where the research is currently being conducted.

[The information follows:]

Project Terminations
FY 1999 - FY 2000

Location	Base Program	FY 1999	FY 2000
ALABAMA:			
Auburn	Immunity and Diagnostics of Diseases and Parasites of Catfish (FY 1998 Fish Disease Incr)	247,000	--
	Immunity and Diagnostics of Diseases and Parasites of Catfish (FY 1999 Fish Disease Incr)	250,000	--
	Fish Diseases and Parasites Research (FY 2000 Fish Disease Incr)	--	425,005
	Total	497,000	425,005
ALASKA:			
Palmer	Arctic Plant Germplasm Introduction and Research (FY 1998 Arctic Germplasm Incr) (Replaces Plant Germplasm Conservation Research)	642,000	650,000
	Total	642,000	650,000
ARKANSAS:			
Stuttgart	Enhancing Rice Grain Quality (FY 1998 Rice Research Incr)	345,800	--
	Rice Genetics Research (FY 1998 Rice Research Incr)	345,800	--
	Research/Evaluation for Registration of Chemicals & Approvals of New Animal Drugs for Aquaculture (Replaces Warmwater Foodfish Health Management Research (FY 1998 National Aqua Res Ctr Incr))	494,000	501,900
	Genetic Improvement of Rice for Yield, Quality, Pest Resistance and Stress Tolerance (FY 2000 Rice Research Incr)	--	425,005
	Total	1,185,600	926,905
Pine Bluff	Improved Aquaculture Production Systems and Products (FY 2000 Aquaculture Incr)	--	425,005
	Total	0	425,005
CALIFORNIA:			
Albany	Biological Control of Yellow Starthistle and Other Non-indigenous Plant Pests in the Western USA	84,900	86,500
	Conversion of Crops to Products with Higher Added Value Through Directed Molecular Evolution (Replaces New Bacterial Polysaccharides for Food and Industry)	318,500	324,500
	Defining the Molecular Mechanisms of Heavy Metal Chilation & Sequestration in Plants	111,100	111,200
	Ecologically Based Management of Salt Cedar (Tamarix SP) in the Western U.S. (Replaces Novel Biopolymers Based on Agricultural Sources)	277,500	--
	Enhanced Production of High-Value Carotenoids in Tomato	391,800	399,300
	Development of Wheat Biopolymer Composites for Industrial and Food Applications (Replaces Flavor Optimization of Major Food Crops through Control of Metabolic Processes)	351,300	--
	Technology to Enhance Soybean Oil for Food and Non Food Uses (Replaces Modification of Vegetable oils as Raw Materials for Industrial Uses)	669,800	--
	Total	2,204,900	921,500
Davis	Sustainable Vineyard Practices Position (FY 2000 Sustainable Vineyard Practices Position Incr)	--	212,502
	Total	0	212,502
Parlier	Irrigation Water & Crop Management to Sustain Productivity and Protect Water Quality (Replaces Shallow Groundwater Management Systems for Arid Irrigated Areas)	241,400	246,000
	Total	241,400	246,000
Salinas	Evaluation, Enhancement, Genetics and Breeding of Lettuce, Melons and Closely Related Species (FY 2000 Greenhouse Lettuce Germplasm Incr)	--	212,502
	Evaluation, Enhancement, Genetics and Breeding of Lettuce, Melons and Closely Related Species (FY 2000 Lettuce Geneticist/Breeder Position Incr)	--	212,502
	Organic Vegetable and Strawberry Production (FY 2000 Organic Minor Crop Specialist Incr)	--	212,502
	Postharvest Pest and Disease Control of Lettuce (FY 2000 Post-Harvest & Controlled Atmosphere Chamber (Lettuce)	--	212,502
	Total	0	850,008

Location	Base Program	FY 1999	FY 2000
DISTRICT OF COLUMBIA:			
Washington	Floriculture (FY 1997 Increase)	196,500	--
	Total	**196,500**	**0**
FLORIDA:			
Gainesville	Behavioral Ecology & Management of Crop Insect Pests w/Semiochemicals	165,100	166,600
	Risk Assessment and Integrated Termite Mgmt Strategies for Hawaii and the Pacific Basin (Replaces Mgt of Termites as Urban Pests in the American Pacific)	141,500	143,200
	Development of Biologically Based Mechanisms of Control of Insect Pests of Fruit, Veg, Field Crops (FY 2000 Biological Controls & Agric. Research Incr)	--	1,700,018
	Total	**306,600**	**2,009,818**
Miami	Development of DNA Markers Associated with Disease Resistance in Cacao (FY 20000 Alternative Crops Incr)	--	425,005
	Total	**0**	**425,005**
GEORGIA:			
Athens	Identification and Molecular Characterization of Agents Causing Poult Enteritis-Mortality Syndrome (FY 1998 Poult Enteritis Incr)	247,000	--
	Application of Molecular Biological Techniques to the Control of Avian Influenza (FY 2000 Asian Bird Influenza Incr)	--	255,003
	Total	**247,000**	**255,003**
Dawson	Develop, Evaluate, and Transfer Technology to Improve Efficiency and Quality of Peanuts (FY 1999 Peanut Research Incr)	500,000	503,100
	Develop Technology/Methodology for Peanut Quality Mgmt. During Production & Post-Harvest Processing (FY 2000 Peanut Quality Research Incr)	--	661,309
	Total	**500,000**	**1,164,409**
HAWAII:			
Hilo	Tropical Aquaculture Feeds and Culture Technology: Development of Shrimp Feeds	1,583,800	1,603,000
	National Tropical, Subtropical Fruit & Nut Crops Germplasm Repository II (FY 2000 U.S. Pacific Basin Ag Research Ctr Incr)	--	425,005
	Total	**1,583,800**	**2,028,005**
IDAHO:			
Aberdeen	Barley and Oat Germplasm Enhancement and Small Grains Germplasm Evaluation and Maintenance (Replaces Conduct and Coordination of Small Grains Germplasm Enhancement and Evaluation (Sm. Grains Res Incr))	98,800	--
	Development and Use of Molecular Techniques in Oat Enhancement	157,900	--
	Development and Use of Molecular Techniques in Oat Enhancement FY 1998 Sm. Grains Res Incr)	98,800	--
	Development of Genetically Enhanced Fish and Feeds for Aquaculture Utilizing Specialized Grains (FY 1999 Alternative Fish Feed Incr)	250,000	251,600
	Total	**605,500**	**251,600**
ILLINOIS:			
Peoria	Anaerobic Microbiological Processes in Animal Waste Management	482,100	--
	Bioprocess and Metabolic Engineering Technologies for Biofuels and Value-Added Coproducts	878,200	--
	Biotechnology R&D Corp. (BRDC)	1,904,700	1,908,200
	Development of Value-Added Products from Seed Proteins: Rheological Properties Performance (Replaces Enhanced Use of Plant Proteins: Identifying, Isolating and Relating Structures to Properties)	567,700	578,300
	New Crops for Industrial Products (FY 1999 Meadowfoam Incr)	200,000	201,300
	Novel Carbohydrate-Based Materials via Bioconversion Processes	558,000	--
	Thermomechanical Processing of Natural Polymers (Replaces Exploratory Thermal Chemical Conversion of Starch to Enhance Derivatization)	158,900	161,900
	Animal Health Consortium	903,500	914,400
	Total	**5,653,100**	**3,764,100**

Location	Base Program	FY 1999	FY 2000
Urbana	Reduced Herbicide Inputs for Effective Weed Management Systems to Improve Water Quality	182,400	--
	Sensors and Systems for Site-Specific Crop Management to Improve Environmental Quality	225,000	--
	Soybean Diseases	337,800	267,800
	Total	**745,200**	**267,800**
IOWA:			
Ames	Ecologically-Based Pest Management of Selected Insect Pests of Corn (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages	52,700	--
	Ecologically-Based Pest Management of Selected Insect Pests of Corn (FY 2000 Risk Assessment of Bt Crops Incr)	--	170,002
	Genetic Characterization of Soybean Germplasm	203,000	--
	Genetics of Host Resistance to Pathogens in Cereal Crops (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages	32,900	33,600
	Impact of Agricultural Management Practices on Soil & Water Quality at the Field & Water Shed (FY 1999 Soil Tilth Incr)	500,000	--
	Quantitative Genetic Analysis and Improvement of Corn Populations (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages)	54,900	--
	Total	**843,500**	**203,602**
KANSAS:			
Manhattan	Genetic Enhancement of Hard Red Winter Wheat for Resistance to Multiple Biotic Stress (Replaces Protecting Hard Red Winter Wheat from Biotic Stress)	245,500	--
	Total	**245,500**	**0**
LOUISIANA:			
New Orleans	Developing Integrated Weed Management Systems for Efficient and Sustainable Sugarcane Production	81,900	83,400
	Disease and Insect Control Mechanisms for the Enhancement of Sugarcane Germplasm Resistance	81,900	83,600
	Formosan Subterranean Termite Control and Research Demonstration Program	5,000,000	5,000,000
	Improving Sugarcane Productivity by Conventional and Molecular Approaches to Genetic Development	229,100	233,800
	Improving Sugarcane Productivity by Conventional and Molecular Approaches to Genetic Development (FY 1998 Sugarcane Biotech Incr)	197,600	201,700
	Total	**5,590,500**	**5,602,500**
MAINE:			
Orono	Potato Production and Disease Management Systems for the Northeast (FY 2000 New England Plant, Soil & Water Res. Lab)	--	178,502
	Management of Soil Nutrients and Animal Manure in Cropping Systems (FY 2000 New England Plant, Soil & Water Res. Lab)	--	76,501
	Total	**0**	**255,003**
MARYLAND:			
Beltsville	Comparative Textural Analysis of Fresh and Fresh-Cut Fruits and Vegetables	316,900	323,300
	Development and Evaluation of New Remote Sensing Technologies to Assess Food and Fiber Production (Replaces Remote Sensing & Associated Technologies for Production Decisions)	204,900	--
	Ecologically-Based Technologies for Controlling Ixodes Scapularis & Reducing Lyme Disease	172,900	176,400
	Ecologically-Based Technologies for Controlling Ixodes Scapularis and Reducing Lyme Disease (FY 1998 Lyme Disease/Tick Mgmt Project in CT, NY, RI, & NJ Incr)	197,600	201,600
	Ecologically-Based Technologies for Controlling Ixodes Scapularis & Reducing Lyme Disease (FY 2000 Lyme Disease Increase)	--	170,002
	Enhancement of Strawberry, Blueberry, & Other Small Fruit Crops Through Molecular Approaches and Breeding	236,500	238,400

Location	Base Program	FY 1999	FY 2000
Beltsville: (continued)	Improving Quality of Fresh and Fresh-Cut Produce by Preventing Deterioration in Cold Storage	446,000	455,000
	National Turfgrass Evaluation Program	54,300	55,400
	Biological Control of the Coffee Berry Borer (FY 2000 Alternative Replacement Crops Incr)		85,001
	Development of Virus-Based Vectors for Expression of Useful Foreign Genes in Plants (FY 2000 Biomedical Materials in Plants Incr)	--	425,005
	Total	1,629,100	2,130,108
MASSACHUSETTS:			
Boston	Dietary Assessments of Rural Older Persons	187,000	197,200
	Total	187,000	197,200
MICHIGAN:			
East Lansing	Identification and Characterization of Quantitative Trait Loci Resistance to Disease in Chicken (Replaces Crop/Animal Systems to Improve Nutrient Management and Sustainability of Dairy Farms)	167,900	--
	Postharvest Handling & Mechanization to Minimize Damage for Fruits	303,400	309,600
	Total	471,300	309,600
MINNESOTA:			
St. Paul	Germplasm Evaluation and Genetic Improvement of Oats and Wild Rice	147,400	150,400
	Wild Rice Breeding & Germplasm Improvement (FY 1998 Wild Rice Incr)	100,000	100,000
	Total	247,400	250,400
MISSISSIPPI:			
Oxford	Biochemistry and Molecular Biology of Natural Products for Pest Control and Alternative Crops (FY 1998 Natural Products Incr) (Replaces Biologically Active Plant Compounds for Insect Control and Biologically Active Phytochemicals)	691,600	352,100
	Development of Natural Products from Plants and Microbes for Replacement of Synthetic Pesticides (Replaces Biologically Active Plant Compounds for Insect Control	--	350,000
	Development of Natural Products from Plants and Microbes for Replacement of Synthetic Pesticides (FY 2000 Nat'l Center for Dev. Of Natural Products Incr)	--	401,392
	Chemistry of Natural Products for Pest Management (FY 2000 Nat'l Center for Dev. Of Natural Products Incr)	--	236,115
	Principles of Acoustic Technology in Soil and Sediment Research (FY 2000 Nat'l Sedimentation Lab Incr)	--	42,500
	Reducing Water Quality Degradation in the Yazoo River Basin (FY 2000 Nat'l Sedimentation Lab Incr)	--	425,005
	Total	691,600	1,807,112
Poplarville	Small Fruit Cultural and Genetic Research in the Mid-South (FY 1998 Small Fruits Incr)	247,000	252,000
	Vegetable and Ornamental Research in the Gulf South (FY 2000 Small Fruits Research Incr)	--	637,507
	Total	247,000	889,507
Stoneville	Agronomic and Economic Evaluation of Kenaf as a Field Crop in Mississippi	482,800	488,700
	Catfish Genetics and Breeding Research (FY 1998 Nat'l W/W Aqua. Incr)	247,000	251,800
	Catfish Genetics and Breeding Research (FY 2000 Nat'l W/W Aqua. Incr)	--	261,803
	Genetic-Physiological parameters that Enhance Fiber Quality (Replaces Development of High Yield, High Quality, & Environmentally Acceptable Cotton Production Systems (Cotton Genetics Incr)	247,000	251,800
	Improve Production Efficiency in Aquaculture (FY 1998 Natl W/W Aqua. Incr)	247,000	250,000
	Alternative Control Strategies for Insect Pests of Corn and Soybean (FY 2000 So. Insect Mgmt Incr)	--	63,751

Location	Base Program	FY 1999	FY 2000
Stoneville (continued)	Areawide Management of Cotton Insect Pests in Midsouth Dev of Improved Surveillance & Pest Management Technol. (FY 2000 Red Imported Fire Ant Incr)	--	297,503
	Total	**1,223,800**	**1,865,357**
Mississippi State	Rearing Research in Support of Coffee Berry Borer Biological Control (FY 2000 Alternative Replacement Crops Incr)	--	85,000
	Total	**0**	**85,000**
MISSOURI:			
Columbia	Improving Surface Water Quality with Alternative Cropping Systems at Field and Watershed Scales (Replaces Farming Systems to Improve Soil and Water Quality)	386,300	364,200
	Improving Surface Water Quality with Alternative Cropping Systems at Field and Watershed Scales (FY 2000 Watershed Research Incr)	--	276,253
	Plant Genetics Research (Replaces Genetic Mechanisms in Wheat (Plant Genetics Equip/Greenhouse Incr))	197,600	200,000
	Sensing Technology for Site-Specific Management to Protect Environmental Resources	--	184,600
	Sensing Technology for Site-Specific Management to Protect Environmental Resources (FY 2000 Mid-West/Mid-South Irrigation Incr)	--	170,002
	Total	**583,900**	**1,195,055**
MONTANA:			
Miles City	Optimizing Reproduction Efficiency to Enhance Profit & Sustainability of Range Beef Production (FY 1998 Repro Eff of Beef Cattle Incr)	247,500	
	Total	**247,500**	**0**
Sidney	Crop, Soil and Water Management (FY 2000 Northern Plains Research Lab Incr)	--	637,507
	Total	**0**	**637,507**
NEBRASKA:			
Clay Center	Metabolism and Nutritional Management of Prolific Sows During Gestation and Lactation (Replaces Influence of Gastrointestinal Neuroendocrine Peptides on Food Intake & Growth of Swine)	204,700	--
	Total	**204,700**	**0**
Lincoln	Genetic Improvement of Sorghum for Feed Quality and Agronomic Fitness (Replaces Biology and Control of Virus Diseases of Sorghum)	140,600	143,400
	Total	**140,600**	**143,400**
NEW YORK:			
Ithaca	Exploration & Maintenance of Fungi & Plants for Biorational Control of Agricultural Pests	49,400	50,200
	Exploration & Maintenance of Fungi & Plants for Biorational Control of Agricultural Pests	133,300	--
	Exploration & Maintenance of Fungi & Plants for Biorational Control of Agricultural Pests (FY 1999 Pear Thrips Incr.)	100,000	100,600
	Developing Ecologically Sound Means of Managing Nematodes Associated with Potato (FY 2000 Golden Nematode Incr)	--	170,002
	Total	**282,700**	**320,802**
Geneva	Evaluation of Pest, Disease Resistance and Stress Tolerance in Grape Rootstocks (FY 2000 Grape Rootstock Incr)	--	212,502
	Total	**0**	**212,502**
Greenport	Protective Immunity to ASF Virus Infection:Identification of Immunogenic Viral Proteins (FY 2000 Animal Vaccines Incr)	--	1,700,018
	Total	**0**	**1,700,018**
NORTH CAROLINA:			
Raleigh	Control of Fungal Pathogens of Small Grains (FY 1998 Sm. Grains Incr.)	247,000	250,000
	Evaluation of Temperate Legumes and Warm-Season Grass Mixtures in Sustainable Production Systems	367,600	375,200

Location	Base Program	FY 1999	FY 2000
Raleigh (continued)	Improved Peanut Product Quality and Bioactive Nutrient Composition with Genetic Resources	280,800	284,200
	Quality Evaluation of Advanced Peanut Breeding Lines (FY 2000 Peanut Quality Research)	--	188,700
	Total	895,400	1,098,100
NORTH DAKOTA			
Fargo	Development of Genetically Diverse, Disease Resistant Sunflower Germplasm (FY 2000 Sunflower Research Incr)	--	151,113
	Sunflower Germplasm Improvement through the Use of Wild Species & Cytogenetic & Biochemical Technique (FY 2000 Sunflower Research Incr)	--	18,889
	Total	0	170,002
OHIO:			
Wooster	Development of Soybean Germplasm & Production Systems for High Yield & Drought Prone Environments	206,200	211,200
	Total	206,200	211,200
OKLAHOMA:			
Stillwater	Improving Resistance of Peanut to Biological Stress Through Germplasm and Cultural Enhancement	147,300	--
	Total	147,300	0
OREGON:			
Corvallis	Physiology, Biochemistry, and Genetic Improvement of Horticultural Crop Productivity and Product Quality (Replaces Biology and Management of Soilborne Diseases and Beneficial Soil and Root-Inhabiting Microorganisms/Effects of Beneficial Rhizosphere Microorganisms on Plant Growth and Health (NW Nursery Crops Incr.))	494,000	--
	Germplasm Resources Genetics & Physiology of Grass and Legume Seed for Sustainable Cropping Systems (Replaces Characterization of Induced Cytokinin Changes in Wheat)	211,000	215,000
	Hops Genetics & Breeding for Improved Flavor, Agronomic Performance & Pest Resistance	75,900	76,400
	Hops Genetics and Breeding for Improved Flavor, Agronomic Performance, and Pest Resistance (FY 1998 Hops Research Incr.)	71,400	72,700
	Physiology, Biochemistry & Genetic Improvement of Horticultural Crop Productivity & Product Quality (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	172,700	75,300
	Characterization, Detection & Control of Viruses Infecting Small Fruit Crops (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
	Biology and Management of Foliage and Fruit Diseases of Horticultural Crops (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
	Biology and Control of Insect Pests of Horticultural Crops (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
	Preservation of Clonal Genetic Resources of Temperate Fruit, Nut, and Specialty Crops (FY 1998 Hops Incr) (Replaces 5358-21000-022 (27,400))	27,400	28,000
	Residue Management and Grass Seed Cropping Systems for Sustainable Agriculture	211,400	215,400
	Small Fruit and Nursery Research (Replaces Specific Cooperative Agreements on Horticultural Crops)	319,100	516,700
	Production Horticultural and Integrated Management Systems of Grapes (FY 2000 Viticulture Incr)	--	382,504
	Total	1,582,900	1,681,904
PENNSYLVANIA:			
Wyndmoor	New Processes for Generating Valuable Co-Products from Corn Fiber (Portion of CRIS)	163,800	--

Location	Base Program	FY 1999	FY 2000
Wyndmoor (continued)	New Processes for Obtaining Higher Value-Added Products from Agricultural Lipids	250,000	--
	Value-Added Products from Fruit and Vegetable Processing Wastes	679,200	--
	Total	1,093,000	0
TEXAS:			
Beaumont	Rice Germplasm and Variety Improvement in the Southern United States (FY 1998 Rice Research Incr.)	247,000	--
	Total	247,000	0
Lubbock	Harvesting and Ginning Technologies for Stripper Cotton (FY 1998 Cotton Ginning Incr)	494,000	503,200
	Novel Germplasm Development for Water-Deficit and Thermal Stress Environments (FY 2000 U.S. Plant Stress & Water Lab Incr)	--	212,503
	Strategies for Irrigated and Dryland Crop Management in Semi-Arid Climates (FY 2000 U.S. Plant Stress & Water Lab Incr)	--	425,004
	Total	494,000	1,140,707
Weslaco	Parasite Mite Control in Honey Bee Colonies Utilized in Honey Production and Crop Pollination (FY 1998 Honey Bee Research Incr.)	494,000	--
	Total	494,000	0
WASHINGTON:			
Pullman	Biochemical and Molecular Regulation of Preharvest Sprouting and Grain Dormancy in Wheat	66,000	--
	Control of Rusts and Smuts of Wheat and Barley (Replaces Control of Foliar Diseases and Smuts of Wheat)	134,300	--
	Genetically Enhanced Wheat for Quality Productivity and Resistance to Biotic and Abiotic Stresses	143,500	--
	Genetics and Germplasm Enhancement of Cool Season Food Legumes (FY 1998 Grain Legume Incr.)	247,000	251,800
	Biology and Biological Control of Root Pathogens in Cereal Based Production Systems (FY 2000 Root Diseases of Wheat/Barley Incr)	--	425,005
	Total	590,800	676,805
Prosser	Integrated Cropping Systems and Precision Technologies for Irrigated Farming (FY 2000 Potato Research Enhancement Incr)	--	212,502
	Total	0	212,502
Yakima	Research/Management of Tree Fruit Insects (FY 2000 Temperate Fruit Flies Incr)	--	212,502
	Total	0	212,502
WEST VIRGINIA:			
Beaver	Agroforestry Systems for the Appalachian Region (FY 1998 Appalachian Soil & Water Conserv. Lab Incr.)	247,000	--
	Pasture Based Beef Systems for Appalachia (FY 2000 Appalachian Pasture-based Beef System Incr)	--	850,009
	Total	247,000	850,009
Leetown	Cool and Cold Water Aquaculture Production in Appalachia (FY 1998 Nat'l Ctr Cool/Cold Water Aqua Incr)	247,000	--
	Utilization of Waste and Byproducts from Aquaculture to Enhance Economic Sustainability (FY 2000 Nat'l Ctr for Cool/Cold Water Aqua Incr)	--	212,502
	Cool and Cold Water Aquaculture Production (FY 2000 Aquaculture Research (Rainbow Trout) Incr)	--	425,005
	Total	247,000	637,507
WISCONSIN:			
Madison	The Role of Life Strategies of Phytopathogenic Bacteria in the Epidemiology of Foliar Diseases	111,600	112,400
	Total	111,600	112,400
HEADQUARTERS	Umbrella Project for Food Safety (FY 2000 Ctr for FS/PH Tech Incr)	--	255,003
	Biobased Products (FY 2000 Biobased Products Incr)	--	200,000
	Binational Agricultural Research & Development (BARD) (FY 2000 BARD Incr)	--	400,000

Location	Base Program	FY 1999	FY 2000
HEADQUARTERS (continued)	Animal Waste Management, IL (FY 2000 Animal Waste Incr)	--	170,002
	Floriculture and Nursery Research Initiative (FY 2000 Flor. & Nursery Crop Incr)	--	1,700,018
	Rearing Research in Support of Coffee Berry Borer Biological Control (FY 2000 Alternative Crops Research Incr)	--	85,001
	Total	0	2,810,024
	Subtotal	33,800,900	42,441,000
	General Reduction	1,199,100	0
	GRAND TOTAL	35,000,000	42,441,000

Mr. Skeen: Please provide for the record a list of all extramural activities that you would discontinue in fiscal year 2001.

[The information follows:]

Location	Project	Amount
Albany, CA	Yellow Starthistle Research and Technology Development *(Extramural-U. Of Idaho)*	$77,290
Gainesville, FL	Management of Termites as Urban Pests in the American Pacific *(Extramural-Univ. Of HI)*	$119,265
	Management Crop Insect Pests with Parasitoids and Predators *(Extramural-Univ. Of FL)*	$110,000
Hilo, HI	Tropical Aquaculture Feeds and Cultural Technology Development-II *(Extramural-Oceanic Inst.)*	$1,407,493
Aberdeen, ID	Development of Genetically Enhanced Fish and Feeds for Aquaculture *(Extramural-Univ. Of Idaho)*	$50,000
Peoria, IL	Biotechnology Research and Development Corporation *(Extramural - Biotechnology Research and Development Corp)*	$1,717,415
	Thermomechanical Processing of Natural Polymers *(Extramural-Univ. Of Capetown)*	$35,111
	Animal Health Consortium *(Extramural-BRDC)*	$823,020
Urbana, IL	Soybean Disease *(Extramural-Univ. Of Illinois)*	$20,000
New Orleans, LA	Biology and Control of the Formosan Subterranean Termite *(Extramural-Various Universities)*	$2,023,680
Beltsville, MD	USDA Northeast Regional Lyme Tick Control Project *(Extramural-Yale)*	$366,311
	Controlling Ixodes Scalpularis & Reducing Lyme Disease *(Extramural - Yale)*	$157,500
Boston, MA	Dietary Assessment of Rural Older Persons *(Extramural-Geisinger Medical Center)*	$177,500

Location	Project	Amount
St. Paul, MN	Wild Rice Breeding & Germplasm Improvement *(Extramural-No. Central Ag. Exp. Sta.)*	$205,451
Oxford, MS	Development of Natural Products from Plants and Microbes for Replacement of Synthetic Pesticides *(Extramural-Univ. Of MS)*	$831,615
Poplarville, MS	Evaluation and Improvement of Small Fruit Germplasm *(Extramural-MAFES)*	$10,000
Stoneville, MS	Research on Kenaf in Mississippi *(Extramural-MS State Univ.)*	$410,986
	Improve Production Efficiency in Aquaculture *(Extramural-MAFES) (Partial)*	$1,937,759
	Catfish Genetics & Breeding Research *(Extramural-Univ. Of MS)*	$50,000
Columbia, MO	Plant Genetics Research *(Extramural-Univ. Of MO)*	$175,610
Lincoln, NE	Genetic Improvement of Sorghum *(Extramural-Univ. Of NE)*	$26,600
Ithaca, NY	Entomopathogenic Fungi of Pear Thrips as Microbial Control Agents *(Extramural-Univ. Of VT)*	$135,000
Corvallis, OR	Small Fruit Germplasm Evaluation *(Extramural-Various Univ.)*	$418,037
	Assessment of Resistance to Hop Powdery Powdery Mildew in USDA Hop Germplasm Collection *(Extramural-WA State Univ.)*	$81,275
Pullman, WA	Arctic Plant Germplasm, Maintenance and Evaluation *(Extramural-State of AK)*	$287,000
Madison, WI	Role of Life Strategies of Phytopathogenic Bacteria in the Epidemiology of Foliar Diseases *(Extramural-Univ. Of WI)*	$90,050
	TOTAL	11,743,968

Mr. Skeen: Please update the table that appears on page 763 of last year's hearing record that displays the annual total item count and funding of proposed and restored project terminations by year.

[The information follows:]

FY	Proposed No.	Proposed Total	Terminated No.	Terminated Total	Restored No.	Restored Total
1995	2	$1,717,975	1	$1,079,855	1	$638,120
1996	40	17,316,949	11	4,203,368	29	13,113,581
1997	47	14,134,500	14	3,428,200	33	10,706,300
1998	71	22,107,800	10	2,203,700	61	19,904,100
1999	92	34,594,300	2	1,723,400	90	32,870,900
2000	93	35,000,000	0	0	93	35,000,000

ARS BUDGET REQUEST

Mr. Skeen: Please list for the record your budget request to the Office of the Secretary, the Secretary's request to the Office of Management and Budget (OMB), and the OMB allowance. We are interested in learning your research priorities, which may differ from the Secretary's Office or OMB's.

[The information follows:]

Agricultural Research Service
FY 2001 Agency/Department/Budget Estimates
(Dollars in Thousands)

	Agency Estimates a/	Department Estimates a/	Budget Estimates
SALARIES and EXPENSES			
FY 2000 Base	$836,868	$836,868	$830,384
Proposed Increases:			
Program Initiatives:			
Emerging and Exotic Diseases	$30,000	$5,000	$4,358
Exotic Diseases (PDD-62)	--	--	10,000
Agricultural Genomes	32,000	7,000	5,350
Human Nutrition Initiative	20,500	10,000	17,250
Aquaculture	15,000	2,000	--
Invasive Species	15,000	4,500	4,300
Food Safety	15,400	5,000	5,720
Food Quality Protection Act/ IPM	6,000	4,031	4,537
Air Quality	10,000	1,000	2,000
Agricultural Genetic	24,000	20,000	6,600
Floriculture/Nursery Crops	8,000	2,000	--
Biobased Products/New Uses	12,000	8,000	14,000
Integrated Farming Systems	5,600	1,000	--
Crops to Replace Tobacco Production and Alternative Uses	30,000	--	--
Climate Change Technology Initiative (Climate Change)	7,000	--	7,000
Integrated Science for Ecological Challenges	31,500	4,000	6,800
Global Research/Support of U.S. Food & Agriculture	16,500	1,000	--
Global Climate Change	7,000	500	7,900
Precision Agriculture	5,000	--	--
Small Farms Initiative	15,000	3,500	--
Agricultural Information	2,500	2,500	2,000
Organic Farming Systems	2,100	1,200	--
Salton Sea Initiative	4,000	--	--
Total FY 2001 Program Increases	314,100	82,231	97,815

Restore FY 2000 Project Termination	--	35,000	--
Operational Needs: Pay Costs	27,133	18,707	8,500
Proposed Decreases:			
Ongoing Projects	--	--	-23,389
FY 2000 Congressional Add-Ons	-- a/	-- a/	-19,052
Total, FY 2001 Salaries & Expenses	1,178,101	972,806	894,258

a/ The Agency and Department Estimates were developed prior to the enactment of the FY 2000 appropriations and therefore use the President's FY 2000 Budget as the base.

	Agency Estimates	Department Estimates	Budget Estimates
BUILDINGS AND FACILITIES			
Proposed Increases:			
National Animal Disease Center, Ames, IA	$24,200	$24,200	$9,000
Beltsville Agricultural Research Center, Beltsville MD	30,000	13,300	13,300
Western Regional Research Center, Albany, CA	4,900	4,900	4,900
National Center for Agricultural Utilization Research Center, Peoria, IL	5,900	5,900	--
Eastern Regional Research Center, Philadelphia, PA	3,500	3,500	--
Plum Island Animal Disease Center, Greenport, NY	142,000	7,000	7,000
Pacific Basin Agricultural Research Center, Hilo/Oahu, HI	46,800	--	--
Avian Disease and Oncology Laboratory, East Lansing, MI	6,000	--	--
Southeast Poultry Research Laboratory, Athens, GA	5,900	--	--
National Agricultural Library, Beltsville, MD	2,800	2,800	1,770
U.S. National Arboretum, Washington, DC	7,960	3,330	3,330
Biological Control Laboratory, Stoneville, MS	14,100	--	--
Richard Russell Research Center, Athens, GA	1,200	--	--
Jamie Whitten Delta States Research Center, Stoneville, MS	2,300	--	--
Kika de la Garza Subtropical Agricultural Research Center, Weslaco, TX	6,100	--	--
Grain Marketing and Production Research Center, Manhattan, KS	8,250	8,250	--
Crop Improvement and Protection Research Laboratory, Salinas, CA	2,100	2,100	--
U.S. Horticultural Research Laboratory, Ft. Pierce, FL	3,000	--	--
Plant and Natural Resources Laboratory, Maricopa, AZ	1,850	--	--
Poisonous Plant Research Laboratory, Logan, UT	9,000	--	--
Fort Keogh Livestock and Range Laboratory, Miles City, MT	550	--	--
Grazinglands Research Laboratory, El Reno, OK	4,800	--	--
U.S. Vegetable Laboratory, Charleston, SC	5,500	--	--
Plant Physiology and Genetic Research Laboratory, Urbana, IL	4,000	--	--
Sugar Beet, Bean and Cereal Research Laboratory, East Lansing, MI	1,600	--	--

Poultry Microbial Safety Research Laboratory, Watkinsville, GA	500	--	--
Air Quality-Plant Growth and Development Research Laboratory, Raleigh, NC	500	--	--
Soil and Water Research Laboratory, Baton Rouge, LA	900	--	--
Energy Management Programs	2,000	--	--
CFC Chillers and Designing Replacement Chiller Systems	2,000	--	--
Seismic Deficient ARS Facilities	2,000	--	--
Total FY 2001 Buildings and Facilities	352,210	75,280	39,300

Mr. Skeen: The ARS budget request contains a "base" funding component of $830 million. Within that base is funding for 1,800 projects that the Administration has deemed appropriate to continue to fund. For the record, how much of the $830 million base funding supports the 1,800 ongoing projects.

Response: The agency actually has 1,100 ongoing research projects instead of 1,800. Each of these research projects are supported in full by the direct appropriations of $830,384,000 for FY 2000.

Mr Skeen: Please provide an alphabetical listing for the record of all projects funded in the fiscal year 2001 budget request and reflected in your Current Research Information System (CRIS). The listing should be contained in a notebook format, tabbed and indexed appropriately for all projects. The projects listing should also provide a brief description of the project, show the fiscal year 2000 allocation and the estimated fiscal year 2001 needs.

Response: An alphabetical listing with a brief description of the projects funded in the fiscal year 2000 budget request reflected in the ARS current Research Information Management System (RMIS) follows. However, we are unable to provide the information requested for fiscal year 2001. This information is not systematically incorporated into the ARS RMIS system until the appropriation is enacted and approved for implementation.

[The information follows:]

Project Description	Allocation
ABSORPTION & METABOLISM OF PHYTOCHEMICALS: ENHANCEMENT OF ANTIOXIDANT DEFENSE MECHANISMS IN AGING	844,494
ABSORPTION AND METABOLISM OF ESSENTIAL MINERAL NUTRIENTS	787,709
ABSORPTION AND UTILIZATION OF ORGANIC AND MINERAL CONSTITUENTS OF PLANT FOODS	535,433
ABSORPTION, DISTRIBUTION, METABOLISM & ELIMINATION OF VETERINARY DRUGS & MYCOTOXINS IN FOOD ANIMALS	933,657
ACQUIRE, MAIN. EVAL. & DISTR. SUBTROPICAL-TROPICAL GERMPLASM WITH ORNAMENTAL MERIT OR POTENTIAL	726,917
ACQUISITION, MAINTENANCE, EVALUATION & UTILIZATION OF SOYBEAN GERMPLASM	487,494
ADHESION OF HUMAN PATHOGENS TO SURFACES OF POULTRY FRUITS AND VEGETABLES	3,198,963
ADV. TECHNOLOGIES FOR REDUCTION OF MICROORGANISMS AND PARTICULATE MATTER IN FOOD PROCESSING	551,591

ADVANCED DIAGNOSTIC METHODS FOR INFECTIOUS DISEASE	415,251
ADVANCED TECHNOLOGIES FOR THE ANALYSIS OF CONTAMINANTS IN MEAT, POULTRY, AND EGGS	1,114,207
AFLATOXIN CONTROL THROUGH ADDITION OF ENHANCEMENT OF ANTIFUNGAL GENES IN CORN AND COTTON	1,351,449
AFLATOXIN CONTROL THROUGH TARGETING MECHANISMS GOVERNING AFLATOXIN BIOSYNTHESIS IN CROPS	1,040,910
AGING, FUNCTIONAL CAPACITY AND NUTRIENT NEEDS	1,005,596
AGRICULTURAL APPROACHES TO...HUMAN HEALTH THROUGH UNDERSTANDING SOIL-PLANT-HUMAN/ANIMAL FOOD SYSTEMS	604,824
AGRICULTURAL WATER MANAGEMENT STRATEGIES AND FLOOD-TOLERANT CROPS FOR THE MIDWEST	375,954
AGROFORESTRY SYSTEMS FOR SMALL FARMS IN THE MID-SOUTH	984,917
AGROFORESTRY SYSTEMS FOR THE APPALACHIAN REGION	693,474
AGRONOMIC AND ECONOMIC EVALUATION OF KENAF AS A FIELD CROP IN MISSISSIPPI	488,690
ALCOHOL CONSUMPTION AND RISK FACTORS FOR CVD AND CANCER	318,843
ALIEN WEEDS IN PASTURES, CROPLANDS, FORESTS, & RECREATIONAL AREAS	422,583
ALLIUM, CUCUMIS AND DAUCUS GERMPLASM ENHANCEMENT, GENETICS & BIOCHEMISTRY	705,213
ALTERNATIVE CONTROL STRATEGIES FOR INSECT PESTS OF CORN & SOYBEAN	550,918
ALTERNATIVE FARMING SYSTEMS TO MAXIMIZE LAND USE, CONSERVE NATURAL RESOURCES, PROTECT ENVIRONMENT	257,480
ALTERNATIVE MANAGEMENT STRATEGIES FOR PLANT NEMATODES: BIOCONTROL AND BIOREGULATION	721,124
ALTERNATIVE MANAGEMENT SYSTEMS TO ENHANCE SURFACE & GROUND WATER QUALITY FROM CLAYPAN SOILS	493,340
ALTERNATIVE SOLVENT SYSTEMS AND TECHNIQUES FOR FOOD ANALYSIS	442,317
ALTERNATIVES TO METHYL BROMIDE FOR MANAGEMENT OF SOILBORNE PATHOGENS IN ORNAMENTAL CROPS	245,908
ALTERNATIVES TO METHYL BROMIDE SOIL FUMIGATION FOR VEGETABLE PRODUCTION	1,262,383
ANAEROBIC MICROBIOLOGICAL PROCESSES IN ANIMAL WASTE MANAGEMENT	491,149
ANALYSIS OF GENETIC DIVERSITY & BIOCHEMISTRY OF CACAO & DRUG CROPS	408,146
ANALYSIS OF PEST CONTROL RESIDUES IN CROPS FOR IR-4 MINOR USE REGISTRATION	158,238
ANALYTICAL DETECTION OF CHEMICALS IN THE SOIL, WATER & AIR	546,688

ANIMAL ARBOVIRUS EPIDEMIOLOGY, CONTROL AND PATHOGENESIS	1,005,567
ANIMAL HEALTH CONSORTIUM	914,467
ANIMAL WASTE MANAGEMENT, IL	170,002
ANTIMICROBIAL RESISTANCE RESEARCH	1,591,133
APPALACHIAN FARMING SYSTEMS	850,009
APPLICATION OF BIOTECHNOLOGY TO WHEAT IMPROVEMENT	571,111
APPLICATION OF MOLECULAR BIOLOGICAL TECHNIQUES TO THE CONTROL OF AVIAN INFLUENZA	1,286,277
APPLICATION OF MOLECULAR BIOLOGY IN DEFINING MECHANISMS OF IMMUNITY TO ANAPLASMA MARGINALE	875,477
AQUACULTURE AND LIVESTOCK FEED SUPPLEMENTS FROM FISH PROCESSING WASTES	1,100,000
AQUACULTURE RESEARCH	425,006
ARCTIC PLANT GERMPLASM INTRODUCTION AND RESEARCH	753,053
AREA-WIDE MANAGEMENT OF AGRICULTURAL PESTS	4,999,881
AREAWIDE MGTMNT OF COTTON INSECT PESTS IN MIDSOUTH DEV OF IMPROVED SURVEILLANCE & PEST MGTMNT TECHNOL	976,701
ARID LAND PLANT GERMPLASM CONSERVATION AND NPGS REGENERATION AND EVALUATION	468,957
ARKANSAS CHILDREN'S HOSPITAL	500,000
ASIAN LONGHORN BEETLE	50,000
ASSESSMENT & EXCHANGE OF PLANT BIODIVERSITY & GENETIC RESOURCES	827,208
ASSESSMENT OF CHARACTERISTICS ASSOCIATED WITH IMPROVING MARKET QUALITY OF POTATOES	430,861
ASSESSMENT OF SINGLE GRAIN PROPERTIES FOR CLASSIFICATION, GRADING AND END-USE SUITABILITY	316,240
ASSESSMENT OF SOIL SALINITY AND SALT LOADING AND DETERMINATION OF AREAL CAUSES AND SOURCES	590,553
ASSURANCE OF MICROBIOLOGICAL SAFETY OF THERMALLY PROCESSED FOODS	814,886
ASTRAGALUS AND OXYTROPIS POISONING IN LIVESTOCK	647,387
ATMOSPHERIC IMPACTS OF AGRICULTURAL MANAGEMENT PRACTICES	897,322
ATTACKING CITRUS NEMATODES	259,101
AUGMENTATION BIOLOGICAL CONTROL OF INSECTS AND WEEDS	438,622
AXENIC & MONOXENICLY PRODUCED ARBUSCULAR MYCORRHIZAL INOCULUM	774,883

BACTERIAL, FUNGAL, VIRUS, AND VIRUS-LIKE DISEASES OF CITRUS	160,406
BARLEY AND OAT GERMPLASM ENHANCEMENT AND SMALL GRAINS GERMPLASM EVALUATION AND MAINTENANCE	1,069,036
BEAN AND PEA GERMPLASM ENHANCEMENT FOR DISEASE AND ENVIRONMENTAL STRESS RESISTANCE	551,389
BEETLE SYSTEMATICS IN SUPPORT OF AGRICULTURE BIOLOGICAL CONTROL URBAN AND FOREST PEST MGMT.	445,959
BEHAVIORAL ECOLOGY AND MANAGEMENT OF CROP INSECT PESTS WITH SEMIOCHEMICALS	518,738
BINATIONAL AGRICULTURAL RESEARCH AND DEVELOPMENT (BARD)	400,000
BIO-BASED PRODUCTS	200,000
BIOAVAILABILITY OF NUTRITION IN THE ELDERLY	864,272
BIOAVAILABILITY OF TRACE ELEMENTS, ESPECIALLY IRON FROM FOOD, & ITS INFLUENCE ON NUTRITURE & FUNCTION	889,578
BIOCATALYTIC PROCESSES FOR CONVERTING SOYBEAN OIL TO VALUE-ADDED INDUSTRIAL PRODUCTS	848,483
BIOCATALYTIC TRANSFORMATION OF PLANT LIPIDS IN UNCONVENTIONAL FLUIDS	470,522
BIOCHEMICAL AND GENETIC BASIS FOR HOST/PATHOGEN RECOGNITION	313,202
BIOCHEMICAL CONSEQUENCES OF SUBOPTIMAL DIETARY INTAKE OF TRACE ELEMENTS	1,145,244
BIOCHEMICAL GENETIC AND ECOLOGICAL EFFECTS OF NATURAL & SYNTHETIC HERBICIDES	382,052
BIOCHEMICAL, PHYSICAL, MICROBIOLOGICAL MANAGEMENT FOR CONTROL OF MYCOTOXIN CONTAMINATION OF PEANUTS	759,384
BIOCHEMICAL, PHYSIOLOGICAL, AND NUTRITIONAL ROLES OF CERTAIN ULTRATRACE ELEMENTS	1,161,866
BIOCHEMISTRY & GENETICS OF INSECT PESTS/PREDATORS/ PARASITOIDS TO ENHANCE BIOLOGICAL CONTROL	838,956
BIOCHEMISTRY AND GENETICS OF HOST PLANT RESISTANCE TO INSECTS, DISEASES, AND NEMATODES	359,781
BIOCHEMISTRY AND MOLECULAR BIOLOGY OF NATURAL PRODUCTS FOR PEST CONTROL & ALTERNATIVE CROPS	1,169,447
BIOCONTROL OF SOILBORNE PLANT PATHOGENS USING NATURAL ATTRIBUTES OF MICROBES AND THEIR ENVIRONS	554,454
BIOCONTROL OF YELLOW STARTHISTLE, SALTCEDAR AND OTHER NON-INDIGENOUS PLANT PESTS IN THE WESTERN US	974,260
BIOCONTROL ORGANISMS DATABASES AND ASSESSMENTS	224,054

BIOCONTROL THROUGH ARTIFICIAL REARING OF NATURAL ENEMIES AND MANIPULATION OF HOST PLANT RESISTANCE	733,811
BIOCONVERSION OF AGRICULTURAL FATS, OILS AND THEIR DERIVATIVES INTO VALUE-ADDED BIOPOLYMERS	601,811
BIODEGRADATION AND THE BIOREMEDIATION OF AGROCHEMICALS IN SOIL	384,704
BIOENERGETIC CRITERIA FOR MEAT ANIMAL ENVIRONMENTAL MANAGEMENT	756,077
BIOGEOCHEMICAL PROCESSES INFLUENCING SOIL STRUCTURE AND ORGANIC CARBON SEQUESTRATION	687,871
BIOLOGICAL & CHEMICAL ALTERNATIVES TO MB FOR STRAWBERRIES, GRAPES, FRUIT & NUT CROPS IN CALIF	495,217
BIOLOGICAL & GENETIC CONTROL OF CROP PESTS EMPHASIZING HELIOTHIS	695,992
BIOLOGICAL AND MOLECULAR APPROACHES ... OF SUGARBEET & VEGETABLE VIRUSES	718,919
BIOLOGICAL CONTROL & INTEGRATED MANAGEMENT OF BLOODSUCKING & NUISANCE FLIES OF MED/AG/VET IMPORT	1,597,860
BIOLOGICAL CONTROL OF DIAMONDBACK MOTH, MEALY-BUG & SILVER LEAF WHITEFLY IN ROW & FIELD CROPS	356,019
BIOLOGICAL CONTROL OF EXOTIC AND INVASIVE PESTS OF AGRICULTURAL IMPORTANCE	1,243,848
BIOLOGICAL CONTROL OF FIRE ANTS	681,371
BIOLOGICAL CONTROL OF GYPSY MOTH & QUARANTINE SERVICES FOR INTRODUCED BENEFICIAL INSECTS	406,984
BIOLOGICAL CONTROL OF RANGELAND WEEDS	943,494
BIOLOGICAL CONTROL OF ROOT PATHOGENS IN CEREAL BASED PRODUCTION SYSTEMS	1,496,344
BIOLOGICAL CONTROL OF SALTCEDAR	417,494
BIOLOGICAL CONTROL OF STORED-PRODUCT INSECTS	792,274
BIOLOGICAL CONTROL STRATEGIES FOR MANAGEMENT OF SUNFLOWER INSECT PESTS	328,390
BIOLOGICAL FILTERS FOR REDUCING CONTAMINANT LOSSES FROM AGRICULTURAL LANDSCAPES	568,379
BIOLOGICAL, CULTURAL, & GENETIC MANAGEMENT OF COTTON NEMATODE	377,364
BIOLOGICAL, GENETIC AND INTEGRATED CONTROL OF SOILBORNE COTTON DISEASES	979,314
BIOLOGICAL, MICROCLIMATE, AND TRANSPORT PROCESSES AFFECTING PEST-CONTROL APPLICATION TECHNOLOGY	536,078
BIOLOGICALLY BASED MANAGEMENT SYSTEMS FOR THE RUSSIAN WHEAT APHID AND OTHER CEREAL APHIDS	573,460

BIOLOGICALLY-BASED MANAGEMENT OF INSECT PESTS OF SUBTROPICAL CROPS	1,098,450
BIOLOGY & POPULATION DYNAMICS OF AFRICANIZED AND THEIR INTERACTION WITH DOMESTIC & FERAL HONEY BEES	373,928
BIOLOGY AND COLLECTION OF NATURAL ENEMIES OF ORCHARD & URBAN INSECT PESTS	290,187
BIOLOGY AND CONTROL OF INSECT PESTS OF HORTICULTURAL CROPS	301,673
BIOLOGY AND CONTROL OF TEPHRITID FRUIT FLIES AND OTHER PESTS	3,829,830
BIOLOGY AND DEVELOPMENT OF ALTERNATIVE CROP POLLINATORS	1,005,800
BIOLOGY AND ECOLOGY OF CROP PESTS EMPHASIZING AREA -WIDE SUPPRESSION OF BOLL WEEVIL AND CORN EARWORM	1,200,383
BIOLOGY AND MANAGEMENT OF FOLIAGE AND FRUIT DISEASES OF HORTICULTURAL CROPS	298,424
BIOLOGY AND MANAGEMENT OF SOILBORNE DISEASES AND BENEFICIAL SOIL AND ROOT-INHABITING MICROORGANISMS	1,137,096
BIOLOGY AND PATHOGENICITY OF NOCTUIDONEMA GUYANENSE ON SPODOPTERA FRUGIPERDA AND S. EXIGUA	306,972
BIOLOGY AND SYSTEMATICS OF FUNGI AND BACTERIA THAT AFFECT TREE FRUIT MARKETABILITY	293,084
BIOLOGY AND VECTOR COMPETENCE OF US INSECT VECTORS OF ARBOVIRAL DISEASES OF ANIMALS	1,036,726
BIOLOGY, ECOLOGY AND MANAGEMENT OF THE BOLL WEEVIL	1,583,033
BIOLOGY, ECOLOGY, AND COLLECTION OF NATURAL ENEMIES OF OF RUSSIAN WHEAT APHID, AND OTHER PESTS	450,476
BIOLOGY, ECOLOGY, SAMPLING AND CONTROL OF WHITEFLIES	1,439,050
BIOLOGY, EPIPEMIOLOGY AND CONTROL OF NEOSPORA CANINUM IN DAIRY AND BEEF CATTLE	884,331
BIOLOGY, ETIOLOGY, AND MANAGEMENT OF PHYTOPHTHORA INFESTANS ON MAJOR VEGETABLES	440,346
BIOLOGY, ETIOLOGY, GENETICS, & CONTROL OF VIRUS DISEASES OF CORN	585,061
BIOLOGY, PHYSIOLOGY, AND CONTROL OF WEEDS IN RICE AND PHYSIOLOGY OF YIELD IN RICE	635,768
BIOPROCESS AND METABOLIC ENGINEERING TECHNOLOGIES FOR BIOFUELS AND VALUE-ADDED COPRODUCTS	894,808
BIOREGULATION OF CITRUS & SUBTROPICAL PLANT-INSECT INTERACTIONS	588,706
BIOREGULATORY & DIETARY FACTOR GOVERNING DIAPAUSE, REPRODUCTION & DEVELOPMENT OF BENEFICIAL INSECTS	560,800

BIOSYSTEMATICS OF HELMINTH PARASITES OF RUMINANTS AND CURATION OF U.S. NATIONAL PARASITE COLLECTION	611,436
BIOTECHNOLOGICAL DEVELOPMENT OF DOMESTIC NATURAL RUBBER-PRODUCING CROPS	412,142
BIOTECHNOLOGY RESEARCH AND DEVELOPMENT CORPORATION (BRDC)	1,908,239
BOVINE AND EQUINE BABESIOSIS: DEFINING PROTECTIVE IMMUNE RESPONSES AND ENHANCED DIAGNOSIS	320,339
BRAIN MATURATIONAL PROCESSES WHICH FORM THE LUTEINIZING HORMONE PULSE GENERATOR	302,024
BREEDING AND GENETIC APPROACHES TO TRACHEAL MITES, AFRICANIZED BEES, AND HONEY BEE STOCK IMPROVEMENT	833,750
BREEDING AND GENETICS OF SOUTHERN PEAS AND PEPPERS	273,253
BREEDING FOR REDUCED LODGING AND SNAPPING, AND EVALUATION OF FOOD-GRADE CORN PERFORMANCE	172,760
BREEDING LEGUMES FOR USE IN SUSTAINABLE AGRICULTURE SYSTEMS	270,196
BREEDING OF DISEASE RESISTANT COCAO CULTIVARS	85,000
BREEDING POTATOES FOR DISEASE AND INSECT RESISTANCE, PROCESSING, AND FRESH MARKET	619,802
BREEDING SELECTION AND MOLECULAR CHARACTERIZATION FOR IMPROVED SUGARBEET GERMPLASM	472,519
BRUCELLOSIS: DNA DIAGNOSTICS, MOLECULAR EPIDEMIOLOGY, AND VACCINE CHARACTERIZATION AND IMPROVEMENT	618,503
CAMPYLOBACTER AND EMERGING BACTERIAL FOODBORNE PATHOGENS IN LIVESTOCK: DECTECTION AND CONTROL	496,368
CAMPYLOBACTER EPIDEMIOLOGY, METHODS DEVELOPMENT AND INTERVENTIONS IN POULTRY	1,414,307
CAPTURING THE UNIQUE NUTRITIONAL AND FUNCTIONAL PROPERTIES OF RICE IN VALUE-ADDED PRODUCTS	1,124,610
CAROTENOIDS FROM FOODS: BIOAVAILABILITY, TRANSPORT AND ANTIOXIDANT ACTIVITY	760,440
CATFISH GENETICS, BREEDING, AND PHYSIOLOGY	2,395,772
CATTLE MUCOSAL IMMUNITY & RESPONSES TO PARASITIC INFECTIONS	941,116
CELL WALL FACTORS LIMITING DIGESTIBILITY AND FORAGE UTILIZATION IN SUSTAINABLE DAIRY FARMING	799,697
CELLULAR & MOLECULAR ASPECTS OF PROMPT & ADAPTIVE RESPONSES TO ENVIRONMENTAL STRESS IN WHEAT	316,819
CELLULAR AND MOLECULAR BIOLOGY OF THE MAMMARY GLAND AS IT RELATES TO METABOLIC DISEASE IN CATTLE	721,479

CEREAL QUALITY GENETICS	277,187
CEREAL VIRUS DISEASES: MECHANISMS OF RESISTANCE & GERMPLASM ENHANCEMENT	297,102
CHARACTERIZATION AND OPTIMIZATION OF ADHESION IN STARCH-POLYMER COMPOSITES	1,047,670
CHARACTERIZATION OF GRAIN BIOCHEMICAL COMPONENTS RESPONSIBLE FOR END-USE QUALITY	697,740
CHARACTERIZATION OF HEALTH-RELATED PHYTOCHEMICALS FROM SOY AND OTHER AGRICULTURAL CROPS	736,824
CHARACTERIZATION, IDENTIFICATION, AND CONTROL OF FOREIGN PLANT PATHOGENIC BACTERIA	297,611
CHARACTERIZATION, IDENTIFICATION, AND CONTROL OF NEW AND EMERGING PLANT PATHOGENIC VIRUSES	304,651
CHARACTERIZATION, PREDICTION AND SCALING OF WATERSHED PROCESSES AND STREAMFLOW	988,924
CHARACTERIZATION,DETECTION & CONTROL OF VIRUSES INFECTING SMALL FRUIT CROPS	339,397
CHARACTERIZE THE NATIONAL SOYBEAN GERMPLASM COLLECTION FOR THE SOUTHERN PRODUCTION AREA	314,561
CHARACTERIZING AND ENGINEERING ABSCISSION-SPECIFIC GENES TO INCREASE SOYBEAN YIELD	362,818
CHEMICAL ECOLOGY AS A COMPONENT OF INTEGRATED MANAGEMENT OF CORN INSECTS	287,320
CHEMICAL SYSTEMS FOR THE CONVERSION OF VEGETABLE OILS TO INDUSTRIAL PRODUCTS	775,383
CHEMISTRY & BIOCHEMISTRY OF INSECT BEHAVIOR, PHYSIOLOGY, AND ECOLOGY	1,373,890
CHEMISTRY AND THERMAL PROCESSING OF PROTEINACEOUS CO-PRODUCTS FOR NONFOOD UTILIZATION	586,089
CHEMISTRY OF NATURAL PRODUCTS FOR PEST MANAGEMENT	689,906
CHILDHOOD EATING BEHAVIOR	871,598
CITRUS HYBRIDIZATION FOR IMPROVED SCIONS AND ROOTSTOCKS	871,623
CITRUS PATHOGEN COLLECTION	181,439
CITRUS QUALITY IMPROVEMENT AND IMPROVED PROCESSED BY-PRODUCT UTILIZATION	540,102
CITRUS TRISTEZA VIRUS AND ITS APHID VECTORS	1,362,147
CITRUS TRISTEZA VIRUS DISEASE	466,678

CLASSICAL BIOLOGICAL CONTROL OF INSECT PESTS OF VEGETABLE, FRUIT, FORAGE AND FIELD CROPS	332,409
COFFEE RESEARCH	85,000
COLLECTION, MAINTENANCE, AND EVALUATION OF WOODY LANDSCAPE PLANTS GERMPLASM REPOSITORY	435,859
COMBINED WATER QUALITY INITIATIVE	137,366
COMMUNICATIONS AND INSECT AND MITE TAXONOMIC SERVICES	112,409
COMPARATIVE TEXTURAL ANALYSIS OF FRESH AND FRESH-CUT PRODUCE	323,378
COMPREHENSIVE MANURE MANAGEMENT FOR IMPROVED NUTRIENT UTILIZATION AND ENVIRONMENTAL QUALITY	764,710
COMPREHENSIVE NUTRIENT MANAGEMENT TO IMPROVE POULTRY PRODUCTION	252,359
COMPREHENSIVE OAT IMPROVEMENT THROUGH NATIONAL GERMPLASM ENHANCEMENT	148,601
CONSERVATION AND UTILIZATION OF GERMPLASM OF SELECTED VEGETABLE CROPS	681,099
CONSERVATION AND UTILIZATION OF SUBTROPICAL/ TROPICAL FRUIT CROPS & TRIPSACUM GENETIC RESOURCES	561,942
CONSERVATION AND UTILIZATION OF THE GENETIC RESOURCES OF APPLES, GRAPES, AND TART CHERRIES	824,037
CONSERVATION SYSTEMS: ECONOMICS AND THE ENVIRONMENT	1,329,451
CONSERVATION, RESTORATION AND UTILIZATION OF RANGELAND	994,054
CONSERVING AND PROMOTING THE USE OF MEDICAGO, TRIFOLIUM AND LOTUS GENETIC RESOURCES	186,044
CONTROL AND PREVENTION OF CRYPTOSPORIDIOSIS	423,711
CONTROL OF APPETITE IN POULTRY, BEEF, AND SWINE	988,411
CONTROL OF FUNGAL PATHOGENS OF SMALL GRAINS	572,139
CONTROL OF FUSARIUM GRAMINEARUM MYCOTOXINS IN WHEAT, BARLEY, AND CORN	968,813
CONTROL OF FUSARIUM MYCOTOXINS AND DISEASES IN CORN AND SMALL GRAINS	1,229,413
CONTROL OF NUTRITIONAL AND SENSORY PROPERTIES OF NEW EXTRUDED FOODS FROM GRAIN AND LEGUMES	912,163
CONTROL OF PATHOGENIC AND SPOILAGE BACTERIA ON RED MEAT	1,160,889
CONTROL OF PATHOGENS ON SURFACES OF POULTRY AND OF FRUITS AND VEGETABLES	1,425,638
CONTROL OF PECAN ARTHROPOD PESTS	665,410

CONTROL OF PERENNIAL AND ANNUAL WEEDS UMBRELLA PROJECT	1,051,796
CONTROL OF RUSTS AND SMUTS OF WHEAT AND BARLEY	275,759
CONTROL OF SALMONELLA DURING POULTRY PRODUCTION	860,487
CONTROL OF THE HONEY BEE PARASITE,VARROA JACOBSONI THROUGH BREEDING AND NOVEL METHODS OF MANAGEMENT	587,508
CONTROL OF TOXIC ENDOPHYTIC FUNGI OF CORN AND GRASSES	1,301,964
CONTROL STRATEGIES FOR HELIOTHIS/HELICOVERPA SPP. & OTHER FIELD CROP INSECTS IN COTTON AGROECOSYSTEM	1,127,871
CONTROL TACTICS AND DECISION MODELS FOR IPM FOR THE NORTHERN GREAT PLAINS	721,874
CONTROLLED DEGRADATION OF BIOPLASTICS	643,646
CONVERSION OF CROPS TO PRODUCTS WITH HIGHER ADDED VALUE THROUGH DIRECTED MOLECULAR EVOLUTION	958,408
CONVERSION OF RENEWABLE MATERIALS INTO BIOPRODUCTS THROUGH FUNGAL, ENZYMATIC, AND PLANT TECHNOLOGIES	638,496
COOL AND COLD WATER AQUACULTURE PRODUCTION	1,675,913
COORDINATED ANALYSIS OF SOYBEAN BREEDING GERMPLASM	153,400
CORN-ETHANOL PROCESS COST REDUCTION	1,306,803
CORRELATIONS BETWEEN FIBER BREAKAGE & PROPERTIES, SURFACE MODIFICATIONS & TEXTILE PROCESSING QUALITY	858,253
COTTON GERMPLASM ENHANCEMENT & PRODUCTION SYSTEMS WITH HIGHER LINT YIELD AND IMPROVED FIBER QUALITY	378,558
COTTON GERMPLASM EVALUATION AND GENOME MAPPING	1,238,479
COTTON PHYSIOLOGY, GENETICS, AND PLANT INSECT INTERACTIONS	1,334,759
COTTON QUALITY IDENTIFICATION AND MEASUREMENTS AFFECTING PROCESSING PERFORMANCE & END USE QUALITY	2,185,772
COTTON WITH IMPROVED WEAR AND RESILIENCY BY FACILE POLYMERIZATION REACTIONS	1,053,149
CRITERIA FOR DESIGN AND REHABILITATION OF WATER CONTROL STRUCTURES AND CHANNELS	775,527
CRITICAL CONTROL POINTS IN CORN RESISTANCE/SUSCEPTIBILITY TO ASPERGILLUS FLAVUS AND AFLATOXIN	921,717
CROP CONSERVATION AND GENETIC ANALYSIS	1,503,247
CROP, SOIL AND WATER MANAGEMENT	1,236,759
CULTIVATION, DISEASE MANAGEMENT AND GERMPLASM ENHANCEMENT OF PECAN	975,238

CYTOGENETICS AND GENETIC ENHANCEMENT OF APOMICTIC PERENNIAL GRASSES	278,002
CYTOKINE-MEDIATED MODULATION OF THE INNATE IMMUNE RESPONSE TO PREVENT SALMONELLOSIS IN POULTRY	549,188
DECIDUOUS FRUIT IMPROVEMENT AND PROTECTION FROM PESTS	967,937
DECISION-MAKING TOOLS FOR INTEGRATED PEST MANAGEMENT OF STORED-PRODUCT INSECTS	672,068
DEFINING THE MOLECULAR CELLULAR MECHANISMS OF HEAVY METAL CHELATION AND SEQUESTRATION IN PLANTS	571,323
DESIGN & CONDUCT OF NATIONWIDE SURVEYS TO MONITOR & ASSESS FOOD CONSUMPTION & RELATED BEHAVIORS	6,471,337
DETECTION AND MANAGEMENT OF PESTICIDE RESISTANCE IN POPULATIONS OF B. MICROPLUS AND THE HORN FLY	1,283,412
DETECTION AND MANAGEMENT OF PESTICIDE RESISTANCE IN THE CATTLE FEVER TICK AND OTHER LIVESTOCK PESTS	466,102
DETECTION AND POPULATION ESTIMATION OF STORED PRODUCT INSECTS	771,429
DETECTION AND PREVENTION OF CHEMICAL AND MICROBIAL CONTAMINATION IN FOODS	1,500
DETECTION AND YIELD ESTIMATION OF NARCOTIC CROPS	712,417
DETECTION OF PATHOGENIC BACTERIA BY BIOSENSORS	1,471,611
DETECTION, DIAGNOSIS, AND ELIMINATION OF PATHOGENS IN INTRODUCED PLANT GERMPLASM	168,581
DETECTION, IDENTIFICATION, AND SURVEILLANCE OF MYCOTOXINS IN CEREALS AND OTHER FOODS	841,620
DETERMINATION OF BIO-ORGANIC NUTRIENTS IN FOODS	550,227
DETERMINATION OF PHYTONUTRIENTS IN FOODS	374,793
DETERMINATION OF SELECTED TRACE ELEMENTS AND ELEMENTAL SPECIES IN FOODS	481,603
DETERMINE ISOFLAVONOID INDUCTION IN LEGUMES AND THEIR PHYTOESTROGENIC EFFECTS IN ANIMAL SYSTEMS	348,990
DEV. OF AREAWIDE MGMT & AERIAL APPLICATION TECH FOR CORN EARWORM, CRW, & OTHER FIELD CROP PESTS	864,874
DEVEL. & ADAPTATION OF NEW & EXISTING ANALYTICAL TECHNOL. FOR THE DETERMINATION OF FOOD COMPONENTS	1,077,482
DEVELOP ALFALFA TO ENHANCE NITROGEN CYCLING AND PROTECT WATER QUALITY	246,247
DEVELOP BIOLOGICAL CONTROL TECHNIQUES AND MASS REARING TECHNOLOGY FOR BENEFICIAL AND PEST INSECTS	1,315,582

DEVELOP COMPREHENSIVE WATER QUALITY MANAGEMENT MODELS	405,702
DEVELOP IMAGING TECHNOLOGY FOR THE INSPECTION OF POULTRY PRODUCTS	1,628,407
DEVELOP INFORMATION SYSTEMS FOR MARKER-ASSISTED SELECTION	198,472
DEVELOP METHODS OF IN VITRO PROPAGATION OF BENEFICIAL INSECTS FOR BIOLOGICAL CONTROL	1,008,954
DEVELOP ON-LINE VERIFICATION AND INTERVENTION PROCEDURES FOR HACCP IN SLAUGHTER/PROCESSING SYSTEMS	888,293
DEVELOP PEANUT MANAGEMENT SYSTEMS TO ENHANCE COMPETITIVENESS AND QUALITY OF U.S. PEANUTS	766,814
DEVELOP PHENOTYPIC/GENOTYPIC & NUTRIENT MANAGEMENT STRATEGIES FOR OPTIMIZING BEEF CATTLE PROD. IN NGP	568,941
DEVELOP SOYBEAN GENOTYPES AND MANAGEMENT SYSTEMS FOR EARLY SEASON AND STRESS ENVIRONMENTS	1,279,708
DEVELOP SUSTAINABLE INTEGRATED WEED MANAGEMENT SYSTEMS FOR COTTON SOYBEANS AND OTHER CROPS	447,573
DEVELOP, EVALUATE, AND TRANSFER TECHNOLOGY TO IMPROVE EFFICIENCY AND QUALITY IN PEANUTS	805,061
DEVELOP/INTEGRATE ALTERNATIVE PEST MGMT STRATEGIES USING NATURAL ENEMIES AND GENETIC APPROACHES	403,297
DEVELOPING BIOLOGICAL/ECOLOGICAL KNOWLEDGE FOR ENHANCING WEED MANAGEMENT SYSTEMS	283,482
DEVELOPING ECOLOGICALLY SOUND MEANS OF MANAGING NEMATODES ASSOCIATED WITH POTATO	588,534
DEVELOPING INTEGRATED WEED MANAGEMENT SYSTEMS FOR EFFICIENT AND SUSTAINABLE SUGARCANE PRODUCTION	440,731
DEVELOPING MGT STRATEGIES AND PLANT GERMPLASM TO IMPROVE GREAT PLAINS AND MIDWESTERN GRASSLANDS	472,067
DEVELOPING POTATO VARIETIES AND GERMPLASM WITH IMPROVED QUALITY, YIELD, AND RESISTANCE TO DISEASE	539,902
DEVELOPMENT AND APPLICATION OF SPATIAL INFORMATION TECHNOLOGIES FOR NATURAL RESOURCE MANAGEMENT	1,166,986
DEVELOPMENT AND CHARACTERIZATION OF THE ARS MICROBIAL GERMPLASM COLLECTION	688,099
DEVELOPMENT AND EVALUATION OF METHODS FOR THE CLINICAL EVALUATION OF MINERAL NUTRITIONAL STATUS	583,013
DEVELOPMENT AND EVALUATION OF NEW REMOTE SENSING TECHNOLOGIES TO ASSESS FOOD AND FIBER PRODUCTION	627,279
DEVELOPMENT & MAINTENANCE OF FLAVOR AND SHELF LIFE IN PEANUTS	245,326

DEVELOPMENT AND MAINTENANCE OF SOYBASE AND INTEGRATION WITH OTHER PLANT GENOME DATABASES	219,552
DEVELOPMENT OF A SIMPLE SEQUENCE REPEAT (SSR) MAP OF SOYBEAN AND REGULATION OF NITROGEN IN THE SEED	613,720
DEVELOPMENT OF A THERMOSTABLE FEED ADDITIVE TO REDUCE PHOSPHATE CONTAMINATION IN GROUNDWATER	817,441
DEVELOPMENT OF ALTERNATIVES TO PESTICIDES FOR CONTROLLING PATHOGENS IN STRAWBERRY & VEG. PROD.	546,733
DEVELOPMENT OF AN EFFICIENT SYSTEM FOR PRODUCTION OF MEAT-TYPE PIGS IN THE SOUTHERN UNITED STATES	164,693
DEVELOPMENT OF AQUACULTURAL SYSTEMS FOR APPALACHIA	1,438,694
DEVELOPMENT OF BIOLOGICAL CONTROL AGENTS FOR WEEDS	578,226
DEVELOPMENT OF BIOLOGICAL CONTROL AND IPM TECHNOLOGY FOR EXOTIC INSECT PESTS	852,752
DEVELOPMENT OF BIOLOGICAL CONTROL TECHNOLOGY FOR EXOTIC INSECT PEST WITH EMPHASIS ON THE ASIAN	403,316
DEVELOPMENT OF BIOLOGICALLY BASED MECHANISMS OF CONTROL OF INSECT PESTS OF FRUIT, VEG, FIELD CROPS	1,700,018
DEVELOPMENT OF BIORATIONAL TECHNOLOGIES FOR COLORADO POTATO BEETLE AND CORN ROOTWORM	1,002,127
DEVELOPMENT OF COTTON GERMPLASM WITH IMPROVED TOLERANCE TO ABIOTIC STRESSES	463,862
DEVELOPMENT OF ENVIRONMENTALLY ACCEPTABLE TECHNOLOGIES FOR PROCESSING CORN	491,876
DEVELOPMENT OF ENVIRONMENTALLY-SOUND COST-EFFECTIVE TECHNOLOGIES TO ERADICATE BOLL WEEVIL	886,586
DEVELOPMENT OF GENETICALLY DIVERSE, DISEASE RESISTANT SUNFLOWER GERMPLASM	497,276
DEVELOPMENT OF GENETICALLY ENHANCED FISH AND FEEDS FOR AQUACULTURE UTILIZING SPECIALIZED GRAINS	251,591
DEVELOPMENT OF GERMPLASM AND MOLECULAR RESOURCES FOR WHEAT IMPROVEMENT	408,319
DEVELOPMENT OF GINNING SYSTEMS AND KNOWLEDGE TO ENHANCE VALUE & TEXTILE UTILITY OF WESTERN COTTONS	1,069,804
DEVELOPMENT OF HERD HEALTH PREVENTIVE MEDICINE TECHNOLOGIES & STRATEGIES FOR BEEF, SWINE, & SHEEP	743,141
DEVELOPMENT OF HIGH YIELD, HIGH QUALITY,& ENVIRONMENTALLY ACCEPTABLE COTTON PRODUCTION SYSTEMS	459,686
DEVELOPMENT OF IMPROVED INSTRUMENTATION TO MEASURE COTTON MATURITY AND FINENESS	375,417

DEVELOPMENT OF IMPROVED PEANUT GERMPLASM WITH RESISTANCE TO DISEASE AND NEMATODE PESTS	455,741
DEVELOPMENT OF INTEGRATED AND SUSTAINABLE FORAGE-LIVESTOCK SYSTEMS FOR THE NORTHERN GREAT PLAINS	1,817,279
DEVELOPMENT OF INTERVENTION PROCESSES TO ENHANCE THE MICROBIOLOGICAL SAFETY OF HEAT SENSITIVE FOODS	1,714,529
DEVELOPMENT OF LARGE-SCALE SEPARATION TECHNOLOGIES FOR PROTEINS	915,689
DEVELOPMENT OF MANAGEMENT STRATEGIES FOR DIAPREPES ABREVIATUS	396,228
DEVELOPMENT OF MB ALTERNATIVE TECHNOLOGIES TO MAINTAIN POSTHARVEST QUALITY OF FRESH COMMODITIES	623,174
DEVELOPMENT OF METHODOLOGY FOR ID & IMPROVEMENT OF DISEASE RESISTANCE IN POTATO & SOLANUM GERMPLASM	341,143
DEVELOPMENT OF METHODS & STRATEGIES TO IMPROVE THE MICROBIOLOGICAL SAFETY OF AQUACULTURE PRODUCTS	552,164
DEVELOPMENT OF METHODS TO CONTROL HEAVY METAL CONTENTS IN SOILS AT BENIGN OR BENEFICIAL LEVELS	277,207
DEVELOPMENT OF MICROBIAL COMPETITIVE EXCLUSION METHODS TO REDUCE PATHOGENIC BACTERIA IN SWINE	1,271,229
DEVELOPMENT OF MICROBIAL MODELING COMPONENTS FOR USE IN RISK ASSESSMENTS	1,232,422
DEVELOPMENT OF MODEL BASED PRECISION AGRICULTURE DECISION SUPPORT SYSTEMS FOR COTTON PRODUCTION	1,121,446
DEVELOPMENT OF MODELS FOR USE IN ECOSYSTEM MANAGEMENT	867,889
DEVELOPMENT OF MULTIPLE PEST RESISTANT SWEETPOTATO AND SNAP BEAN GERMPLASM	248,400
DEVELOPMENT OF NATURAL PRODUCTS FROM PLANTS AND MICROBES FOR REPLACEMENT OF SYNTHETIC PESTICIDES	1,319,170
DEVELOPMENT OF NOVEL VACCINES AND NON-IMMUNITY BASED STRATEGIES TO CONTROL FMD	2,186,356
DEVELOPMENT OF ON-LINE SYSTEMATIC RESOURCES ABOUT FUNGI AND THE U.S. NATIONAL FUNGUS COLLECTIONS	272,036
DEVELOPMENT OF PESTICIDE APPLICATION TECHNOLOGIES FOR CONTROL OF PESTS IN FIELD CROPS	1,295,981
DEVELOPMENT OF PROCESSES TO IMPROVE OILSEED UTILIZATION	766,989
DEVELOPMENT OF RESOURCES FOR GENETIC IMPROVEMENT OF SMALL GRAINS AND SUGARCANE	770,661
DEVELOPMENT OF SAMPLING PLANS THAT ACCURATELY DETECT MYCOTOXINS IN PEANUTS AND CORN	231,949

DEVELOPMENT OF SOYBEAN GERMPLASM AND PRODUCTION SYSTEMS FOR HIGHYIELD & DROUGHT PRONE ENVIRONMENTS	211,180
DEVELOPMENT OF SUSTAINABLE AND ORGANIC FARMING SYSTEMS & MANAGEMENT PRACTICES (IN MID-ATLANTIC)	490,924
DEVELOPMENT OF TECHNIQUES FOR ONLINE SAFETY INSPECTION OF AGRICULTURAL PRODUCTS	1,022,094
DEVELOPMENT OF TECHNOLOGY FOR EFFICIENT CROP PRODUCTION SYSTEMS	681,070
DEVELOPMENT OF TECHNOLOGY FOR WEAVING SIZELESS COTTON WARPS ON MODERN HIGH SPEED WEAVING MACHINES	358,340
DEVELOPMENT OF TROPICAL FRUIT CROP PRODUCTION SYSTEMS	1,111,592
DEVELOPMENT OF USER-FRIENDLY SOFTWARE FOR THE MANAGEMENT OF IRRIGATED, SALT-AFFECTED SOILS	194,092
DEVELOPMENT OF VALUE-ADDED PRODUCTS FROM SEED PROTEINS: RHEOLOGICAL PROPERTIES, PERFORMANCE	578,381
DEVELOPMENT OF VIRUS-BASED VECTORS FOR EXPRESSION OF USEFUL FOREIGN GENES IN PLANTS	1,261,746
DEVELOPMENT OF WHEAT BIOPOLYMER COMPOSITES FOR INDUSTRIAL AND FOOD APPLICATIONS	1,116,518
DIAGNOSIS AND CONTROL OF MYCOPLASMOSIS IN POULTRY	556,720
DIAGNOSIS, PATHOGENESIS AND ANTIGENIC AND GENETIC INTERACTIONS OF TRANSMISSIBLE ENCEPHALOPATHIES	1,388,896
DIAGNOSIS, PATHOGENESIS, AND CONTROL OF CHLAMYDIOSIS IN LIVESTOCK AND POULTRY	421,700
DIAGNOSIS, PATHOGENESIS, AND IMMUNOLOGY OF PARATUBERCULOSIS (JOHNE'S DISEASE) IN CATTLE	1,387,802
DIESEL FUEL, EXTENDERS AND ADDITIVES FROM VEGETABLE OILS	778,141
DIET GENE INTERACTIONS	766,484
DIET, ANTIOXIDANTS AND HUMAN HEALTH	1,036,018
DIETARY ANTIOXIDANTS, AGING, AND OXIDATIVE STRESS STATUS	628,025
DIETARY ASSESSMENT OF RURAL OLDER PERSONS	186,857
DIETARY EFFECTS ON NEUROLOGICAL FUNCTION	929,621
DIETARY FACTORS IN EARLY DEVELOPMENT: LONG-TERM HEALTH CONSEQUENCES AND EFFECTS ON BRAIN FUNCTION	3,519,484
DIETARY FATTY ACIDS AND OTHER NUTRIENTS AND MODULATION OF RISK FACTORS FOR CVD AND CANCER	1,103,151
DIETARY TRACE ELEMENTS AND PHYSIOLOGY OF THE CARDIOVASCULAR & RELATED SYSTEMS	449,926

DIOXINS AND OTHER ENVIRONMENTAL CONTAMINANTS IN FOOD	1,106,156
DISCOVER & DEVELOP BIOLOGICAL CONTROL AGENTS FOR RANGELAND WEEDS	532,888
DISCOVER AND EVALUATE SOUTH AMERICAN BIOLOGICAL AGENTS TO CONTROL SELECTED PESTS IN THE U.S.	513,132
DISCOVER, SYNTHESIZE, DEVELOP ATTRACTANTS AND BEHAVIOR-MODIFYING CHEMICALS TO MANAGE INSECTS	838,352
DISCOVERY OF NATURAL PRODUCTS FOR CONTROL OF MICROBIAL PESTS AND DISEASES IN AGRICULTURE	565,562
DISCOVERY OF PEST BEHAVIOR-MODIFYING CHEMICALS WITH ENHANCED BIOLOGICAL POTENCY	330,844
DISEASE AND INSECT CONTROL MECHANISMS FOR THE ENHANCEMENT OF SUGARCANE GERMPLASM RESISTANCE	447,638
DISEASE RELATED PROBLEMS OF POULTRY PRODUCTION AND PROCESSING	549,159
DIVERSE CROPPING SYSTEMS FOR THE NORTHERN GREAT PLAINS	1,330,709
DRAINAGE WATER RECYCLING SYSTEMS FOR WATER QUALITY PROTECTION IN THE MIDWEST	440,607
DRYLAND AGRICULTURAL SYSTEMS TO REDUCE RUNOFF & SOIL EROSION	704,452
DRYLAND CROPPING SYSTEMS TO IMPROVE WATER AND NUTRIENT USE EFFICIENCY AND RESOURCE PROTECTION	1,363,532
DYNAMIC SIMULATION MODEL FOR EVALUATION OF STRATEGIC BEEF CATTLE MANAGEMENT DECISIONS	441,513
ECOLOGICALLY-BASED PEST MANAGEMENT	1,007,246
ECOLOGICALLY-BASED PEST MANAGEMENT OF SELECTED INSECT PESTS OF CORN	750,709
ECOLOGICALLY-BASED TECHNOLOGIES FOR CONTROLLING IXODES SCAPULARIS AND REDUCING LYME DISEASE	1,310,217
ECOLOGY OF TEMPERATE DESERT RANGELANDS	788,254
EFFECT OF MODERATE CHANGES IN DIET ON HEALTH STATUS OF OBESE ADULTS	716,490
EFFECT OF NUTRITION AND AGING ON EYE LENS PROTEINS, PROTEASES, AND CATARACT	878,514
EFFECTS OF APPLICATION METHODS AND COVER CROPS ON HERBICIDE AND NITRATE FATE IN NO-TILL SYSTEMS	508,676
EFFECTS OF COPPER DEPLETION ON CARDIOVASCULAR FUNCTION & METABOLISM	675,067
EFFICACY AND RESIDUAL DATA OF INSECTICIDES AGAINST INSECT PESTS OF VEGETABLE CROPS	30,348
EMERGING VIRAL DISEASES OF SWINE	447,542

ENABLING TECHNOLOGIES FOR WHEAT STARCH AND PROTEIN SEPARATION, DRYING, AND UTILIZATION	392,978
ENDOCRINE & IMMUNE MECHANISMS AFFECTING GROWTH IN YOUNG CATTLE	1,312,981
ENDOGENOUS DEVELOPMENT FACTORS FOR PLANT NEMATODE CONTROL & IMPROVEMENT OF ENTOMOPATHOGENIC NEMATODE	654,854
ENGINEERING INNOVATIONS AND MICRO DEVELOPMENTS TO REDUCE CONTAMINATION OF POULTRY AND EQUIPMENT	987,596
ENHANCE WHEAT QUALITY AND UTILIZATION	552,827
ENHANCED COTTON FIBER QUALITY THROUGH IMPROVEMENTS IN MEASUREMENT TECHNOLOGY AND GENETIC ENGINEERING	513,948
ENHANCED PRODUCTION OF HIGH-VALUE CAROTENOIDS IN TOMATO	399,278
ENHANCEMENT AND EVALUATION OF TRAITS TO INCREASE USE, FORAGE QUALITY, AND PERSISTENCE OF ALFALFA	246,116
ENHANCEMENT OF FRESH FRUIT AND VEGETABLE QUALITY WITH EDIBLE COATINGS AND OTHER TECHNOLOGIES	423,374
ENHANCEMENT OF SMALL FRUIT GERMPLASM THROUGH BREEDING WITH EMPHASIS ON DISEASE RESISTANCE	1,102,689
ENHANCEMENT OF SOIL PROPERTIES THROUGH SOIL MANAGEMENT	726,676
ENHANCEMENT OF STRAWBEERY, BLUEBERRY & OTHER FRUIT CROPS THROUGH MOLECULAR APPROACHES	878,636
ENHANCEMENT OF THE ACTIVITY OF MICROBIAL AGENTS FOR BIOLOGICAL CONTROL OF INSECT PESTS	660,494
ENHANCING AGRONOMIC & VALUE-ADDED TRAITS OF CORN GERMPLASM	503,191
ENHANCING BIOTIC PEST RESISTANCE IN CORN GERMPLASM	976,534
ENHANCING FUNCTIONAL & HEALTH PROMOTING PROPERTIES OF CEREAL GRAINS & LEGUMES THROUGH PROCESSING	820,469
ENHANCING RESISTANCE IN ALFALFA GERMPLASM TO PATHOGENS & ABIOTIC STRESS	460,930
ENHANCING SOBYEAN SEED COMPOSITION AND PEST RESISTANCE	431,918
ENHANCING SOIL, WATER AND AIR QUALITY IN THE NORTHWEST WHEAT REGION	468,864
ENHANCING SOYBEAN FOR RESISTANCE TO THE SOYBEAN CYST NEMATODE	440,839
ENHANCING THE EFFICACY OF BIOCONTROL AGENTS FOR CONTROLLING WEEDS IN LEGUMES AND NONCROPLANDS	194,811
ENHANCING WHEAT GERMPLASM THROUGH IMPROVED DISEASE RESISTANCE, QUALITY, AND AGRONOMIC PERFORMANCE	480,087
ENTOMOPATHOGENIC FUNGI AS BIOCONTROL AGENTS OF PEST INSECTS OF AGRICULTURAL CROPS	657,686

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ENVIRONMENTAL, GENETIC AND BIOCHEMICAL FACTORS AFFECTING OAT GRAIN AND FIBER QUALITY	205,631
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EPIDEMIOLOGY AND CONTROL OF SALMONELLA	970,784
EPIDEMIOLOGY AND ECOLOGY OF SALMONELLA ENTERITIDIS IN COMMERCIAL POULTRY FLOCKS	333,602
EPIDEMIOLOGY APPLIED TO PROBLEMS OF AGING AND NUTRITION	892,177
EPIZOOTIOLOGY, PATHOGENESIS, AND MOLECULAR VIROLOGY OF PSEUDORABIES OF SWINE	463,082
EROSION PROCESS AND PREDICTION TECHNOLOGY TO IMPROVE SOIL & WATER QUALITY	323,039
ESTABLISH PUBLIC DISPLAY GARDENS FOR WOODY & HERBACEOUS LANDSCAPE PLANTS	2,550,833
ESTIMATION OF ENERGY INTAKE AND PHYSICAL ACTIVITY IN FREE-LIVING ADULTS	707,907
ETHOLOGY OF FOOD PRODUCING ANIMALS	985,541
ETIOLOGY & BIOLOGICALLY-BASED MANAGEMENT OF FIRE BLIGHT ON POME FRUITS	293,086
ETIOLOGY AND CONTROL OF SOILBORNE DISEASES OF FRUIT TREES WITHOUT THE USE OF METHYL BROMIDE	293,084
ETIOLOGY AND IMPACT OF DISEASES CAUSED BY FUNGI AND VIRUSES ON FORAGES USED FOR NUTRIENT CYCLING	254,198
ETIOLOGY, EPIDEMIOLOGY AND MANAGEMENT OF DISEASES OF DECIDUOUS TREE FRUITS AND NUTS, AND SMALL FRUIT	718,717
EVAL. OF ENVIRON. IMPACTS OF DIFFERENT NEMATODE & WEED MGMT. SYSTEMS IN THE SOUTHERN COASTAL PLAIN	216,699
EVALUATE/DEVELOP TECHNOLOGY FOR INCREASED GRADING EFFICIENCY, FOOD SAFETY, AND QUALITY OF PEANUTS	201,669
EVALUATION AND CHARACTERIZATION OF PLANT PATHOGENS FOR BIOLOGICAL CONTROL OF WEEDS	1,139,863
EVALUATION AND ENHANCEMENT OF RESISTANCES IN COLE CROP, MELON AND WATERMELON GERMPLASM	533,114
EVALUATION AND ENHANCEMENT OF RICE GERMPLASM	314,012
EVALUATION AND ENHANCEMENT OF SORGHUM GERMPLASM	347,740
EVALUATION OF ADVANCED POTATO CLONES FOR RESISTANCE, AGRONOMIC, & CULINARY TRAITS	141,322

EVALUATION OF ASCITES IN POULTRY	302,700
EVALUATION OF BIOLOGICAL OTHER NONCHEMICAL WEED CONTROL METHODS	300,361
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EVALUATION OF NSGC AND ELITE SMALL GRAINS GERMPLASM	443,092
EVALUATION OF PEST, DISEASE RESISTANCE AND STRESS TOLERANCE IN GRAPE ROOTSTOCKS	514,032
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EVALUATION OF TEMPERATE LEGUMES AND WARM-SEASON GRASS MIXTURES IN SUSTAINABLE PRODUCTION SYSTEMS	375,197
EVALUATION OF TROPICALLY ADAPTED BEEF CATTLE GERMPLASM IN THE SUBTROPICS OF THE UNITED STATES	779,602
EVALUATION STUDY PROJECT ON WATER MANAGEMENT ISSUES AFFECTING DADE COUNTY	607,387
EVALUATION, ENHANCEMENT, GENETICS AND BREEDING OF LETTUCE, MELONS AND CLOSELY RELATED SPECIES	1,260,772
EXOTIC CORN & CORN RELATIVES FOR OPTIMIZING PRODUCTION PRACTICES AFFECTING GROUND WQ.	245,922
EXPLOITATION OF NEUROPEPTIDES FOR CONTROL OF MEDICAL AND VETERINARY ARTHROPOD PESTS	858,071
EXPLOITATION OF THE ARS MICROBIAL GERMPLASM COLLECTION FOR AGRICULTURAL AND INDUSTRIAL USES	1,171,796
EXPLORATION AND MAINTENANCE OF FUNGI AND PLANTS FOR BIORATIONAL CONTROL OF AGRICULTURAL PESTS	721,106
EXPRESSION OF GENES INFLUENCING SEED QUALITY	261,109
FACTORS AFFECTING GENE EXPRESSION IN FLORAL MONOCOTS WITH EITHER CONSTITUTIVE OR ... PROMOTERS	451,344
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FATE AND ENVIRONMENTAL IMPACT OF AGRICULTURAL NUTRIENTS IN SUSTAINABLE PRODUCTION SYSTEMS	1,192,928
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FINE MAPPING OF QUANTITATIVE TRAIT LOCI IN LIVESTOCK GENOMES	929,140
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FOOD SAFETY - ANIMAL MANURE HANDLING AND DISTRIBUTION	1,958,324
FOOD SAFETY - LISTERIA AND E COLI	1,000,000
FOOD SAFETY - LISTERIOSIS	300,000
FOOD SAFETY - RISK ASSESSMENT	1,066,667
FOOD SAFETY PATHOGEN REDUCTION	218,333
FOOD SAFETY, WASTE MINIMIZATION, AND VALUE ENHANCEMENT OF FERMENTED AND LIGHTLY PROCESSED VEGETABLES	1,003,746
FOOD SAFETY-DEVELOP NOVEL GENETIC BASED INTERVENTION STRATEGIES WHICH ... FOOD SAFETY BARRIERS	400,000
FOOD SAFETY/ANTIBIOTIC RESISTANCE	1,500,000
FORAGE GERMPLASM DEVELOPMENT FOR INCREASED SUSTAINABILITY OF AGRICULTURAL AND RANGELAND ECOSYSTEMS	834,639
FOREIGN EXPLORATION FOR BIOLOGICAL CONTROL AGENTS OF MELALEUCA & OTHER EXOTIC PLANT PESTS OF THE US	251,452
FOREIGN EXPLORATION FOR NATURAL ENEMIES OF INSECTS, WEEDS, AND PLANT PATHOGENS	109,446
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FRUIT FLY MANAGEMENT THROUGH NOVEL APPLICATIONS	462,216
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FUNCTIONAL GENOMICS-BASED MANAGEMENT OF STORED-PRODUCT INSECT PESTS	786,811
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GENETIC BASES FOR THE BIOCHEMICAL DETERMINANTS OF WHEAT QUALITY	574,752
GENETIC CHANGE IN CALVING EASE AND QUANTITATIVE TRAIT LOCI DETECTION IN CATTLE POPULATIONS	896,306
GENETIC CHARACTERIZATION, DEVELOPMENT AND HETEROSIS IN SOYBEAN GERMPLASM	372,303
GENETIC CONTROL OF VIRUS RESISTANCE IN WHEAT	479,237
GENETIC DISEASE RESISTANCE TO MUCOSAL PATHOGENS IN LIVESTOCK	592,466
GENETIC DIVERSITY AND MOLECULAR BIOLOGY OF ARBOVIRUSES	659,734
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GENETIC ENGINEERING OF DAIRY BACTERIA FOR FOOD & NON-FOOD APPLICATIONS	540,367
GENETIC ENHANCEMENT FOR RESISTANCE TO INSECTS & NEMATODES IN COTTON	541,127
GENETIC ENHANCEMENT OF WHEAT AND ALFALFA FOR RESISTANCE TO MULTIPLE BIOTIC STRESS	1,414,672
GENETIC IMPROVEMENT AND EVALUATION OF WINTER WHEATS & OATS	410,981
GENETIC IMPROVEMENT OF BARLEY	454,961
GENETIC IMPROVEMENT OF CORN AND SORGHUM FOR RESISTANCE TO INSECTS AND AFLATOXIN	258,283
GENETIC IMPROVEMENT OF FRUIT CROPS	1,287,214
GENETIC IMPROVEMENT OF LEGUMES FOR IMPROVED PERSISTENCE & PRODUCTIVITY WHEN GRAZED BY CATTLE	468,064
GENETIC IMPROVEMENT OF RICE FOR YIELD, QUALITY, PEST RESISTANCE, AND STRESS TOLERANCE	2,492,229
GENETIC IMPROVEMENT OF SCION AND ROOTSTOCKS FOR FRUIT QUALITY, PEST RESISTANCE OF PRUNUS & VITIS	717,867
GENETIC IMPROVEMENT OF SORGHUM FOR FEED QUALITY & AGRONOMIC FITNESS	583,223
GENETIC MAPPING OF QUANTITATIVE TRAIT LOCI IN DAIRY CATTLE	1,079,477
GENETIC MECHANISMS AND MOLECULAR GENETIC RESOURCES FOR CORN	416,817
GENETIC MECHANISMS IN WHEAT	232,358

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GENETICALLY ENHANCE WHEAT FOR QUALITY PRODUCTIVITY & RESISTANCE TO BIOTIC AND ABIOTIC STRESSES	552,006
GENETICS & GERMPLASM ENHANCEMENT OF COOL SEASON FOOD LEGUMES	662,938
GENETICS AND REARING OF TEPHRITID FRUIT FLIES AND THEIR PARASITOIDS	983,570
GENETICS OF HOST RESISTANCE TO PATHOGENS IN CEREAL CROPS	216,642
GENETICS, BREEDING AND ENHANCEMENT OF SUGARBEET GERMPLASM FOR RESISTANCE AND PRODUCTIVITY	635,133
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MOLECULAR IMPROVEMENT OF ALFALFA FOR DISEASE RESISTANCE & NOVEL CROP USES	179,794
MOLECULAR PHYSIOLOGY APPROACHES FOR THE IMPROVEMENT OF TROPICAL CROPS	1,342,344
MOLECULAR PHYSIOLOGY, DETECTION AND BIOCONTROL OF FASTIDIOUS PROKARYOTES AND PHYTOPLASMAS	591,767
MOLECULAR SYSTEMATICS AND DIAGNOSTICS FOR PARASITES OF FOOD AND FOOD ANIMALS	302,394
MOLECULAR SYSTEMATICS OF PLANT PATHOGENIC FUNGI IMPORTANT TO U.S. AGRICULTURE	604,623
MOLECULAR-GENETIC CHARACTERIZATION OF TOBACCO MOSAIC VIRUS RESISTANCE GENES	569,768
MONITORING, PREVENTION, AND CONTROL STRATEGIES FOR STORED-PRODUCT INSECTS	656,351
MULTIPLICATION & EVALUATION OF POTATO BREEDING SELECTIONS	234,817
MUSCADINE GRAPE CULTURAL AND GENETIC RESEARCH	256,834
NATIONAL ANIMAL GERMPLASM PROGRAM	328,242
NATIONAL CENTER FOR COOL AND COLDWATER AQUACULTURE	212,502
NATIONAL CLONAL CITRUS AND DATE GERMPLASM REPOSITORY	434,654
NATIONAL COTTON VARIETY TEST PROGRAM	459,456
NATIONAL GERMPLASM REPOSITORY FOR TROPICAL AND SUBTROPICAL PLANT GERMPLASM	444,764
NATIONAL SMALL GRAINS COLLECTION - MAINTENANCE, DISTRIBUTION, DOCUMENTATION, AND ACQUISITION	398,354
NATIONAL TROPICAL, SUBTROPICAL FRUIT & NUT CROPS GERMPLASM REPOSITORY II	923,424
NATIONAL TURFGRASS EVALUATION PROGRAM	55,433
NEMATODE, DISEASE, WEED, INSECT AND MITE CONTROL ON MINOR FOOD CROPS AND ORNAMENTALS	126,670
NEMATODES & DISEASES OF DECIDUOUS FRUITS IN THE SOUTHWESTERN U.S.	427,584

NEW APPROACHES TO ENSURE POSTHARVEST QUALITY & REDUCE DECAY OF FRUITS	563,238
NEW BIOBASED PRODUCTS TO INCREASE DEMAND FOR GRAINS	966,858
NEW COMMERCIALLY USEFUL MATERIALS FROM SUCROSE AND SUGARCANE-DERIVED BYPRODUCTS	144,444
NEW CROPS FOR INDUSTRIAL PRODUCTS	1,217,717
NEW MANAGEMENT APPROACHES FOR INSECT PESTS OF VEGETABLE CROPS	669,898
NEW PROCESSES FOR OBTAINING HIGHER VALUE-ADDED PRODUCTS FROM AGRICULTURAL LIPIDS	1,484,156
NEW PRODUCTS FROM MILK COMPONENTS BY EXTRUSION	955,991
NEW STRATEGIES FOR DETECTION AND CONTROL OF FOOT-AND-MOUTH	2,810,966
NEW TECHNOLOGIES IN COTTON GINNING TO ENHANCE FIBER QUALITY AND VALUE	1,450,950
NEW TECHNOLOGIES TO IMPROVE AND ASSESS MEAT QUALITY & SAFETY	1,406,681
NEW TECHNOLOGIES TO INCREASE UTILIZATION OF FRUITS AND VEGETABLES AS RESTRUCTURED PRODUCTS	699,302
NODULATION AND NITRATE METABOLISM EFFICIENCY OF LEGUMES	262,613
NON-CHEMICAL METHODS FOR CONTROL OF STORED PRODUCT AND QUARANTINE PESTS OF FRESH/DRIED FRUIT AND NUTS	1,098,056
NONCHEMICAL CONTROL METHODS FOR INSECT PESTS OF POTATOES	928,659
NONCHEMICAL PEST CONTROL AND ENHANCED SUGARBEET GERMPLASM VIA TRADITIONAL & MOLECULAR TECHNOLOGIES	822,967
NONWOVEN FABRICS/COMPOSITES FROM COTTON & OTHER NATURAL FIBERS	734,739
NOVEL ALTERNATIVES FOR PLANT NEMATODE CONTROL: ULTRASTRUCTURAL & CRYOBIOLOGICAL APPROACHES	413,764
NOVEL CARBOHYDRATE-BASED MATERIALS VIA BIOCONVERSION PROCESSES	735,498
NUTRIENT - GENE INTERACTIONS	1,141,458
NUTRIENT AND ENDOCRINE BASIS FOR METABOLIC AND INFECTIOUS DISEASE RESISTANCE IN DAIRY CATTLE	918,086
NUTRIENT CONSERVATION AND ODOR REDUCTION IN SWINE & CATTLE CONFINEMENT FACILITIES	480,526
NUTRITION OF MOTHER AND CHILD DURING PREGNANCY AND LACTATION	910,614
NUTRITION, AGING AND IMMUNE RESPONSE	1,880,857
NUTRITIONAL & ENVIRONMENTAL MANAGEMENT TO IMPROVE QUALITY & PRODUCTION EFFICIENCY OF POULTRY	825,980

NUTRITIONAL AND MANAGEMENT STRATEGIES TO IMPROVE REPRODUCTIVE PERFORMANCE IN GILTS AND SOWS	644,800
NUTRITIONAL AND PHYSIOLOGICAL FACTORS AFFECTING SPLANCHNIC ENERGY METABOLISM IN RUMINANTS	1,628,948
NUTRITIONAL PROGRAMMING DURING CRITICAL PERIODS OF DEVELOPMENT	1,181,293
NUTRITIONAL REGULATION OF CELL GROWTH, DIFFERENTIATION & DEVELOPMENT	2,148,243
NUTRITIONAL, MICROBIAL, AND LAND APPLICATION REGIMENS FOR UTILIZATION OF FEEDLOT WASTES	772,930
OBJECTIVE GRADING AND END-USE PROPERTY ASSESSMENT OF SINGLE KERNELS AND BULK GRAIN SAMPLES	783,611
OOCYTE AND EMBRYO DEVELOPMENT, CONSERVATION, AND PRESERVATION IN SWINE	939,628
OPTIMIZATION & INTEGRATION OF ESSENTIAL CHEMICAL CONTROL METHODS FOR POSTHARVEST & QUARANTINE PESTS	1,062,480
OPTIMIZATION AND PREDICTION OF FOOD SENSORY QUALITY THROUGH INNOVATIVE TECHNOLOGIES	421,268
OPTIMIZATION OF SUPERCRITICAL AND SUBCRITICAL FLUID PROCESSES FOR AGRIMATERIALS	647,209
OPTIMIZATION OF THE FLAVOR & TEXTURE OF FRESH-CUT FRUIT PRODUCTS	709,376
OPTIMIZING BIOGEOCHEMICAL PROCESSES FOR AGROECOSYSTEMS	1,400,577
OPTIMIZING CATFISH/WATER QUALITY INTERACTIONS TO INCREASE CATFISH PRODUCTION EFFICIENCY	503,573
OPTIMIZING FLAVOR QUALITY AND OXIDATIVE STABILITY OF COMMODITY VEGETABLE OILS	766,901
OPTIMIZING REPRODUCTION EFFICIENCY TO ENHANCE PROFIT & SUSTAINABILITY OF RANGE BEEF PRODUCTION	797,376
ORGANIC MINOR CROPS SPECIALIST	212,502
OVARIAN FOLLICULAR DEVELOPMENT AND OVULATION IN BEEF CATTLE	229,149
PARASITIC MITE CONTROL IN HONEY BEE COLONIES UTILIZED IN HONEY PRODUCTION AND CROP POLLINATION	1,314,354
PATHOGEN CONTAMINATION IN FOOD ANIMALS, IN PARTICULAR SWINE	302,091
PATHOGEN TRANSPORT AND DISSEMINATION FROM MANURES	746,473
PATHOGENESIS AND RESISTANCE MECHANISMS FOR THE IMPROVED CONTROL OF MAREK'S DISEASE	1,019,553
PATHOGENESIS OF ASPERGILLUS FUMIGATUS INFECTIONS IN TURKEYS AND IMMUNE MECHANISMS OF PROTECTION	352,901

PATHOGENESIS, DETECTION, AND CONTROL OF SALMONELLA ENTERITIDIS AND OTHER SALMONELLAE IN CHICKENS	1,044,987
PATHOGENESIS, DIAGNOSIS AND MOLECULAR EPIDEMIOLOGY OF VESICULAR STOMATITIS VIRUSES	1,054,172
PATHOGENESIS, DIAGNOSIS, & EPIDEMIOLOGY OF BOVINE TUBERCULOSIS	1,327,131
PATHOGENS OF NARCOTIC PLANTS AND THEIR USE IN BIOLOGICAL CONTROL STRATEGIES TO REDUCE NARCOTICS	715,161
PEANUT ALLERGENICITY AS AFFECTED BY END PRODUCTS PRODUCED DURING ROASTING	582,034
PEANUT QUALITY RESEARCH	850,009
PECAN GENETICS AND IMPROVEMENT	480,460
PERENNIAL WEED CONTROL BASED ON PLANT BIOCHEMISTRY, PHYSIOLOGY AND MOLECULAR BIOLOGY	1,327,983
PEST POPULATION ECOLOGY AND BEHAVIORAL MECHANISMS IN CROPPING SYSTEMS FOR THE NORTHERN GREAT PLAINS	713,884
PHYSICAL AND BIOCHEMICAL PROPERTIES OF HARD RED SPRING & DURUM WHEATS	603,731
PHYSIOLOGICAL AND BIOCHEMICAL REGULATION OF CARBOHYDRATE METABOLISM IN CEREAL TISSUES	296,313
PHYSIOLOGICAL APPROACHES TO MAXIMIZE PRODUCTION EFFICIENCY AND MINIMIZE PRODUCTION RISKS	364,456
PHYSIOLOGICAL CONTRIBUTIONS OF AUGMENTATIVE BIOCONTROL OF WHITEFLIES	548,794
PHYSIOLOGICAL MECHANISMS OF STRESS AND GROWTH IN NEONATAL PIGS	629,537
PHYSIOLOGICAL, BIOCHEMICAL, & MOLECULAR MECHANISMS REGULATING N AND P ACQUISITION AND USE IN LEGUMES	315,539
PHYSIOLOGICAL/BIOCHEMICAL CONTROL OF POTATO BUD DORMANCY, SPROUT CONTROL & SKIN SET SUBERIZATION	655,464
PHYSIOLOGY OF STRAWBERRY, BLUEBERRY & OTHER SMALL FRUIT CROPS IN SUSTAINABLE PRODUCTION SYSTEMS	683,186
PHYSIOLOGY, BIOCHEMISTRY,& GENETIC IMPROVEMENT OF HORTICULTURAL CROP PRODUCTIVITY & PRODUCT QUALITY	1,099,961
PHYTOCHEMICAL RESPONSES TO ENVIRONMENTAL STRESS: IMPLICATIONS FOR GLOBAL CHANGE AND NUTRITION	1,927,140
PHYTONUTRIENT BIOCHEMISTRY, PHYSIOLOGY, AND TRANSPORT	1,428,303
PINUS & GUTIERREZIA SPECIES: TOXICOSES & ABORTION IN LIVESTOCK	547,622
PLANT AND ANIMAL RESPONSES TO ENVIRONMENT AND MANAGEMENT	808,094

PLANT AND SOIL DYNAMICS ON SMALL FARMS TO ACHIEVE SUSTAINABLE GRAZING	503,108
PLANT AND SOIL MANAGEMENT STRATEGIES FOR SUSTAINING DRYLAND AGROECOSYSTEMS	878,356
PLANT GENETICS RESEARCH	200,000
PLANT GERMPLASM AND INFORMATION MANAGEMENT	1,732,780
PLANT GERMPLASM CONSERVATION RESEARCH	1,737,736
PLANT RESISTANCE AND GERMPLASM ENHANCEMENT FOR MANAGING INSECT PESTS OF SOUTHERN CROPS	740,480
PLANT RESOURCES FOR SUSTAINABLE FORAGE-LIVESTOCK PRODUCTION SYSTEMS IN THE SOUTHERN GREAT PLAINS	1,098,030
PLANT RESPONSE TO WATER-DEFICIT AND THERMAL STRESSES	1,640,831
POISONING OF LIVESTOCK BY LARKSPUR (DELPHINIUM) SPECIES	547,623
POPULATION BIOLOGY OF BIOLOGICAL CONTROL AGENTS INTRODUCED FOR CONTROL OF ARTHROPOD PESTS & WEEDS	332,639
POPULATION GENETICS OF CEREAL RUST FUNGI IN RELATION TO RACE-SPECIFIC AND NON-SPECIFIC RESISTANCE	282,597
POPULATION MANAGEMENT OF INSECTS TO PROTECT STORED PRODUCTS	837,131
POST-HARVEST SANITATION OF CUCUMBERS	222,544
POST-MORTEM MUSCLE/MEAT CHANGES THAT AFFECT PRODUCT SAFETY AND QUALITY	771,058
POSTHARVEST COMMODITY TREATMENTS FOR QUARANTINE SECURITY & QUALITY MAINTENANCE	1,389,648
POSTHARVEST HANDLING & MECHANIZATION TO MINIMIZE DAMAGE FOR FRUITS	309,521
POSTHARVEST PEST AND DISEASE CONTROL OF LETTUCE	212,502
POSTHARVEST QUALITY AND PHYSIOLOGY OF VEGETABLES & SMALL FRUITS	434,776
POTATO GENETICS, CYTOGENETICS & PREBREEDING/ ENHANCEMENT UTILIZING WILD & CULTIVATED SPECIES	239,291
POTATO PRODUCTION & DISEASE MANAGEMENT SYSTEMS FOR THE NORTHEAST	1,081,450
POTATO RESEARCH	1,534,907
POTATO VARIETY DEVELOPMENT THROUGH GENE TRANSFER & VIROLOGY	647,821
POULTRY BONE PHYSIOLOGY	316,120
POULTRY WASTE MANAGEMENT	498,766
PRACTICAL APPLICATION OF MOLECULAR GENETICS FOR IMPROVED POTATO CULTIVARS	758,787

PRE-HARVEST ENVIRONMENTAL EFFECTS ON COTTON FIBER-QUALITY	680,482
PRECIPITATION AND WATERSHED CHARACTERIZATION AND MODELING FOR AGRICULTURAL WATERSHEDS	365,531
PRECISION FARMING TO PROTECT WATER QUALITY, CONSERVE RESOURCES, WITH IMPROVED IRRIGATION TECH.	1,581,920
PREDICTING CHEMICAL PROCESSES FOR MGMT OF SALT-AFFECTED SOILS	667,460
PREDICTING THE MORPHOLOGY AND MECHANICAL PROPERTIES OF BIOPOLYMER BLENDS	785,067
PREHARVEST CONTROL OF AFLATOXIN	871,631
PREHARVEST CONTROL OF ZOONOTIC PARASITES IN SWINE	1,055,266
PREHARVEST ECOLOGY & CONTROL OF ENTEROHEMORRHAGIC ESCHERICHIA COLI (EHEC) & SALMONELLA IN LIVESTOCK	1,731,419
PREPARATION AND PROPERTIES OF STARCH-LIPID COMPOSITES FOR INDUSTRIAL APPLICATIONS	1,040,654
PRESERVATION & DISTRIBUTION OF TREE FRUIT & NUT CROPS & GRAPES	639,000
PRESERVATION OF BASE PLANT GERMPLASM COLLECTION	1,780,267
PRESERVATION OF CLONAL GENETIC RESOURCES OF TEMPERATE FRUIT, NUT AND SPECIALITY CROPS	863,403
PRESERVATION OF HONEY BEE GERMPLASM	364,897
PRESERVATION OF PLANT GERMPLASM RESEARCH	1,517,512
PREVENT PATHOGEN CONTAMINATION IN FOOD PRODUCING ANIMALS, IN PARTICULAR CATTLE	286,864
PREVENT THE OCCURRENCE OF TOXINS IN WATER TO PROTECT FOOD & THE ENVIRONMENT	302,351
PREVENT ZOONOTIC PATHOGEN TRANSMISSION AND IMPROVE THE VALUE OF DAIRY MANURE TO THE ENVIRONMENT	604,788
PREVENTING PATHOGEN TRANSPORT TO SOUTHERN PIEDMONT LANDSCAPES FROM POULTRY PRODUCTION SYSTEMS	302,066
PREVENTION & THERAPY FOR PROTOZOAN PARASITES AFFECTING FOOD ANIMALS, FOOD SAFETY, PUBLIC HEALTH	1,253,010
PREVENTION AND CONTROL OF SALMONELLA AND OTHER ENTEROPATHOGENS IN POULTRY DURING GROWOUT	1,210,883
PREVENTION OF LOSSES FROM COLIBACILLOSIS AND ESCHERICHIA ECOLI O157:H7 IN CATTLE AND SWINE	1,448,869
PREVENTION OF PATHOGEN CONTAMINATION IN FOOD PRODUCING ANIMALS	551,926
PRINCIPLES OF ACOUSTIC TECHNOLOGY IN SOIL & SEDIMENT RESEARCH	530,277
PROCESSES CONTROLLING AGRICHEMICAL PARTITIONING, ENTRAINMENT, AND TRANSPORT	295,830

PROCESSING FOREIGN PLANT GERMPLASM THROUGH FEDERAL QUARANTINE	1,207,654
PROCESSING TREATMENTS TO IMPROVE THE PHYSICAL AND CHEMICAL PROPERTIES OF LEATHER AND WOOL	970,314
PRODUCTION AND STABILIZATION OF LIVING MICROBIAL AGENTS	462,023
PRODUCTION HORTICULTURAL AND INTEGRATED MGMT SYSTEMS OF GRAPES	689,586
PRODUCTION METHODS AND GERMPLASM ENHANCEMENT FOR VEGETABLE CROPS IN THE SOUTHERN PLAINS	468,392
PRODUCTIVITY & WATER USE OF CROPS AS INFLUENCED BY GLOBAL CHANGE	894,939
PROTECTION OF SUBTROPICAL & TROPICAL AGRICULTURE COMMODITIES & ORNAMENTALS FROM EXOTIC INSECTS	1,241,902
PROTECTIVE IMMUNITY TO ASF VIRUS INFECTION: IDENTIFICATION OF IMMUNOGENIC VIRAL PROTEINS	3,425,452
PROVIDING QUARANTINE FOR INTERNATIONAL AND DOMESTIC EXCHANGE OF SACCHARUM (SUGARCANE)	335,400
QUALITY AND SAFETY OF NONFAT DRY MILK AND WHEY PRODUCTS FOR CHEESEMAKING	769,358
QUALITY ENHANCEMENT OF FRUIT PRODUCTS USING MILD PROCESSES AND ENZYMES WITH MULTIVARIATE ANALYSIS	549,810
QUALITY MAINTENANCE AND FOOD SAFETY OF FRESH AND FRESH-CUT FRUITS AND VEGETABLES	1,112,456
QUANTIFYING ENVIRONMENTAL HYDROLOGIC PROCESSES	838,483
QUANTIFYING NUTRIENT METABOLISM WITH MATHEMATICAL MODELING	344,673
QUANTITATIVE AND QUALITATIVE NUTRITION ASSESSMENT AT THE COMMUNITY LEVEL	970,566
QUANTITATIVE CHARACTERIZATION OF NATURAL SCREWWORM POPULATION ECOLOGY IN CENTRAL AMERICA	613,940
QUANTITATIVE DETERMINATION OF PATHOGEN REDUCTION DURING ANIMAL SLAUGHTER AND FOOD PROCESSING	984,958
QUANTITATIVE GENETIC ANALYSIS AND IMPROVEMENT OF CORN POPULATIONS	551,700
QUANTITATIVE REMOTE SENSING APPROACHES FOR MONITORING & MANAGING AGRICULTURAL RESOURCES	847,113
QUARANTINE ALTERNATIVES AND MANAGEMENT OF SUBTROPICAL FRUIT AND VEGETABLE PESTS	996,237
RANGELAND AND PASTURE ECOSYSTEM MGMT IN THE SOUTHERN PLAINS	860,492
RANGELAND ECOLOGY, MANAGEMENT AND UTILIZATION BY SHEEP	733,951
RANGELAND RESPONSES TO MANAGEMENT AND GLOBAL CHANGE	1,024,683

REARING RESEARCH IN SUPPORT OF COFFEE BERRY BORER BIOLOGICAL CONTROL	85,000
REDUCE MASTITIS INCIDENCE AND ANTIBIOTIC USE BY ENHANCING COW'S NATURAL DEFENSES	1,048,519
REDUCE WATER QUALITY DEGRADATION IN THE YAZOO RIVER BASIN	425,006
REDUCE ZOONOTIC PATHOGENS IN SWINE AND THEIR ENVIRONMENT	604,182
REDUCED-RISK INTEGRATED MANAGEMENT OF MEDICALLY-IMPORTANT HOUSEHOLD ARTHROPOD PESTS	666,561
REDUCING NITRATE CONTAMINATION FROM SURFACE WATERS FROM SUBSURFACE DRAINED FIELDS	823,477
REDUCING POSTHARVEST LOSSES OF HORT. PRODUCTS BY ENHANCING TOLERANCE TO ABIOTIC AND BIOTIC STRESS	972,447
REDUCTION AND CONTROL OF PATHOGENS ASSOCIATED WITH FOOD PROCESSING SURFACES	919,007
REDUCTION IN FUNGICIDE USE BY DETERMINING ALTERNATE STRATEGIES TO CONTROL POSTHARVEST DECAY	793,908
REDUCTION OF AFLATOXIN IN TREE NUTS THROUGH CONTROL OF INSECT PESTS USING NATURAL PRODUCTS	964,867
REDUCTION OF FUSARIUM MYCOTOXINS AS CONCERNS IN AGRICULTURAL COMMODITIES	848,397
REDUCTION OF SWINE PRODUCTION ODOR THROUGH NUTRITION & MICROBIOLOGY	1,196,400
REGENERATION AND EVALUATION OF MAIZE AND OTHER GERMPLASM	168,300
REGULATION OF ENERGY BALANCE AND BODY COMPOSITION	1,757,163
REGULATION OF GENE EXPRESSION IN NUTRIENT METABOLISM	390,262
REGULATION OF OVARIAN FOLLICULAR DEVELOPMENT IN BEEF CATTLE	295,813
REGULATION OF PROBLEMATIC FLAVORS IN CATFISH	676,970
RELATIONSHIP BETWEEN MINERAL NUTRITION & RISK FACTORS FOR CANCER	622,321
REMOVAL OF AFLATOXIN CONTAMINATION FROM HUMAN FOODS IN REAL TIME BY IMAGING TECHNIQUES	438,170
RENIFORM NEMATODE RESEARCH	500,000
RENOVATION OF UNDERUTILIZED HILL LANDS & DIVERSIFICATION OF SMALL FARM PRODUCTION IN APPALACHIA	1,439,623
REPELLENT SYSTEMS & CONTROL STRATEGIES FOR MOSQ/ VECTORS OF MEDICAL & VETERINARY IMPORTANCE	552,744
REPLACEMENT OF HERBICIDES AND METHYL BROMIDE BY MICROBIOLOGICAL CONTROL OF WEEDS	990,121

REQUIREMENTS AND FUNCTIONS OF CHROMIUM IN IMPROVING HEALTH	406,842
RESEARCH AND DEVELOPMENT FOR PLANT GENOME INFORMATICS	888,537
RESEARCH COORDINATION OF MINOR USE PESTICIDE REGISTRATIONS	209,488
RESEARCH ON MALTING QUALITY IMPROVEMENT IN BARLEY	813,978
RESEARCH/EVALUATION FOR REGISTRATION OF CHEMICALS AND APPROVALS OF NEW ANIMAL DRUGS FOR AQUACULTURE	1,575,534
RESEARCH/MANAGEMENT OF TREE FRUIT INSECTS	1,165,360
RESIDUE IMPACTS ON SOIL SURFACE PROCESSES AFFECTING SOIL AND AIR QUALITY	894,891
RESIDUE MANAGEMENT AND GRASS SEED CROPPING SYSTEMS FOR SUSTAINABLE AGRICULTURE	215,389
RESISTANCE FACTORS FOR PROTECTION OF WHEAT FROM STEM AND LEAF RUST AND OATS FROM CROWN RUST	280,761
RESISTANCE TO DISEASES AND NEMATODES IN VEGETABLE CROPS	612,087
RESPIRATORY TRACT DISEASE OF RUMINANTS	1,476,097
RHIZOSPHERE BIOLOGY AND ECOPHYSIOLOGY OF INVASIVE AQUATIC WEEDS INTEGRATED MANAGEMENT	460,812
RHIZOSPHERE INTERACTIONS AMONG PLANTS, BENEFICIAL MICROBES AND PATHOGENS	554,456
RICE GENETICS AND GERMPLASM ENHANCEMENT	418,067
RICE GERMPLASM AND VARIETY IMPROVEMENT IN THE SOUTHERN UNITED STATES	1,480,028
RISK ASSESSMENT AND INTEGRATED TERMITE MANAGEMENT STRATEGIES FOR HAWAII AND THE PACIFIC BASIN	143,221
RISK MODELING TO IMPROVE THE MICROBIOLOGICAL SAFETY OF POULTRY PRODUCTS	245,943
ROLE OF NATURAL PRODUCTS IN HOST RESISTANCE AND INTEGRATED WEED MANAGEMENT IN VEGETABLE CROPS	451,921
ROLE OF RIPARIAN BUFFER SYSTEMS IN FILTERING AGRICULTURAL EFFLUENTS	355,122
RUMEN MICROBES AND THEIR INTERACTIONS WITH SECONDARY PLANT METABOLITES	484,909
SCREWWORM STRAIN DEVELOPMENT, GENETIC ADAPTION TO MASS PRODUCTION AND IMPROVED METHODS	382,523
SELECTION FOR LITTER SIZE IN SWINE	330,977
SEMIOCHEMICALLY-MEDIATED ENHANCEMENT OF NATIVE BENEFICIALS AND SUPPRESSION OF KEY PEST INSECTS	453,071

SENSING MOISTURE CONTENT AND QUALITY OF GRAIN AND OTHER AGRICLTRL PRODUCTS BY DIELECTRIC PROPERTIES	461,129
SENSING TECHNOLOGY FOR SITE-SPECIFIC MANAGEMENT TO PROTECT ENVIRONMENTAL RESOURCES	651,202
SENSORS AND SYSTEMS FOR SITE-SPECIFIC CROP MGMT TO IMPROVE ENVIRONMENTAL QUALITY	229,547
SENSORY AND PHYSICOCHEMICAL PROPERTY RELATIONSHIPS IN FOOD THAT DEFINE AND PREDICT END-USE QUALITY	311,497
SEX PRESELECTION IN MAMMALS AND SPERM PRESERVATION IN LIVESTOCK AND POULTRY	1,061,700
SITE- AND SITUATION-SPECIFIC MANAGEMENT TO REDUCE USE AND OFFSITE MOVEMENT OF AGRICHEMICALS	1,163,294
SITE- AND TIME-SPECIFIC CROP, TILLAGE, AND WEED MGMT FOR SUSTAINABLE AGROECOSYSTEMS	1,665,761
SMALL FRUIT AND NURSERY RESEARCH	516,667
SMALL FRUIT CULTURAL AND GENETIC RESEARCH IN THE MID-SOUTH	1,120,591
SMALL FRUIT PRODUCTION SYSTEMS	329,857
SOIL AND WATER MANAGEMENT TO OPTIMIZE PRODUCTION & ENHANCE NATURAL RESOURCES	630,204
SOIL EROSION BY WATER: BIOTIC AND ABIOTIC PROCESSES, IMPACTS, AND AMELIORATION	1,553,816
SOIL EROSION PROCESSES, NATURAL RESOURCE MODELS, AND DECISION SUPPORT SYSTEMS	1,299,209
SOIL HEALTH AS AN INDICATOR OF SUSTAINABLE MANAGEMENT	546,381
SOIL MICROBIAL ECOLOGY AND SOIL RESOURCE MANAGEMENT	610,209
SOIL MICROBIAL POPULATIONS & THEIR EFFECTS ON SOIL SUBSIDENCE	251,954
SOIL QUALITY ASSESSMENT, DISCERNMENT, AND MANAGEMENT	738,444
SOIL QUALITY OF SUSTAINABLE AGRICULTURAL SYSTEMS & IMPACTS ON HERBICIDE & ALTERNATIVE WEED MGMT SYSTEM	723,664
SOIL, WATER, FERTILITY AND AGROCHEMICAL MANAGEMENT FOR SOIL AND WATER QUALITY IN AGRICULTURAL AREAS	643,653
SOMATIC & MOLECULAR PROCEDURES FOR EXCHANGING GENETIC INFORMATION BETWEEN SOLANUM SPECIES	212,538
SORGHUM ERGOT RESEARCH	300,000
SORTING AGRICULTURAL MATERIALS FOR DEFECTS AND INCLUSIONS USING IMAGING AND PHYSICAL METHODS	432,732
SOYBEAN DISEASES	267,846

SPECTRAL AND SPATIAL MEASUREMENTS AND MODELING TO IMPROVE AGRICULTURAL PRODUCTIVITY AND ENVIRONMENT	600,538
SPECTROSCOPIC SENSORS AND MULTIVARIATE CALIBRATION METHODS FOR QUALITY ASSESSMENT OF COMMODITIES	1,118,974
STAFFING AND OPERATION FOR NATIONAL CLONAL REPOSITORIES FOR PLANT GERMPLASM	93,247
STIMULATION OF MUCOSAL IMMUNITY IN CHICKENS TO PROTECT AGAINST ENTERIC AND RESPIRATORY PATHOGENS	472,854
STRATEGIC FEEDING TO OPTIMIZE USE OF FEED RESOURCES BY DIVERSE BREEDS OF CATTLE AND SHEEP.	794,912
STRATEGIES FOR IRRIGATED AND DRYLAND CROP MANAGEMENT IN SEMI-ARID CLIMATES	1,070,033
STRATEGIES OF CONTROLLING NARCOTIC PLANT PRODUCTION	1,313,376
STRATEGIES TO CONTROL SWINE PARASITES AFFECTING FOOD SAFETY	782,063
STRATEGIES TO OPTIMIZE CARCASS YIELD AND MEAT QUALITY OF RED MEAT ANIMALS	955,150
STRESS ADAPTATION AND VIRULENCE EXPRESSION OF BACTERIAL PATHOGENS IN FOOD ENVIRONMENTS	1,393,589
STRUCTURAL SOURCES OF VARIATION IN COTTON FIBER QUALITY	673,396
SUCROSE ACCUMULATION & THE ELEMENTS OF HETEROSIS IN SUGARBEET	619,193
SUGARBEET ROOT MAGGOT BIOCONTROL GERMPLASM ENHANCEMENT & DISEASE RESISTANCE SELECTION STRATEGIES	237,681
SUGARCANE DISEASES: BIOLOGY/CONTROL BY DEVELOPING TECHNIQUES TO SELECT RESISTANT GERMPLASM	251,781
SUGARCANE GERMPLASM ENHANCEMENT & DIVERSIFICATION TO DEVELOP SUSTAINABLE AGRICULTURE SYSTEMS	1,145,450
SUNFLOWER GERMPLASM IMPROVEMENT THROUGH THE USE OF WILD SPECIES & CYTOGENETIC & BIOCHEMICAL TECHNIQUE	826,052
SURFACE INTERACTIONS INFLUENCING MANAGEMENT OF AGROCHEMICAL LOSS TO AIR AND WATERSHEDS	981,361
SUSTAINABLE AGRICULTURAL PRODUCTION SYSTEMS FOR CLAY SOILS	629,970
SUSTAINABLE AGRICULTURAL SYSTEMS THAT REDUCE WIND EROSION AND DUST EMISSIONS	456,609
SUSTAINABLE AGROECOSYSTEMS IN THE SOUTHERN PIEDMONT	1,084,354
SUSTAINABLE LIVESTOCK-FORAGE SYSTEMS FOR SMALL FARMS IN THE MID-SOUTH	1,255,740
SUSTAINABLE MANAGEMENT OF RANGELANDS	1,013,663

SUSTAINABLE MANAGEMENT STRATEGIES FOR CONTROLLING WETLAND AND AQUATIC WEEDS	1,443,567
SUSTAINABLE MANAGEMENT SYSTEMS FOR INSECT PESTS OF SHADE TREES IN THE MID-ATLANTIC REGION	597,160
SUSTAINABLE SYSTEMS FOR MANAGING MANURE FROM DAIRY CATTLE	1,117,077
SUSTAINABLE UTILIZATION OF SOIL AND WATER RESOURCES IN GRAZINGLANDS ENVIRONMENTS	1,133,118
SUSTAINABLE VINEYARD PRACTICES RESEARCH	212,502
SWINE RESPIRATORY DISEASES	542,587
SYSTEMATICS & BIOLOGY OF MOTHS, LEAFHOPPERS & TRUE BUGS OF IMPORTANCE TO AGRICULTURE & SILVICULTURE	651,600
SYSTEMATICS AND GERMPLASM COLLECTION OF POTATOES & THEIR WILD RELATIVES	227,919
SYSTEMATICS OF BIOCONTROL FUNGI: TRICHODERMA AND ITS HYPOCREA SEXUAL STATES	235,829
SYSTEMATICS OF FLIES OF IMPORTANCE IN BIOLOGICAL CONTROL, AGRICULTURAL CROPS AND FORESTS	607,261
SYSTEMATICS OF MITES, SCALES, APHIDS, THRIPS, TERMITES & WHITEFLIES OF AGRICULTURAL IMPORTANCE	699,887
SYSTEMATICS OF PARASITIC AND PLANT-FEEDING WASPS OF AGRICULTURAL IMPORTANCE	648,776
SYSTEMATICS OF VASCULAR PLANTS IMPORTANT TO AGRICULTURE	397,274
TAXONOMY AND IDENTIFICATION OF ECONOMICALLY IMPORTANT PLANT-PARASITIC NEMATODES	422,873
TAXONOMY AND NOMENCLATURE OF CULTIVATED WOODY PLANTS	478,737
TECHNOLOGIES FOR IMPROVED SELECTION AND EVALUATION OF RESISTANCE TO SUGARBEET DISEASES	188,274
TECHNOLOGIES FOR MANAGEMENT AND REMEDIATION OF DESERT RANGELANDS	1,562,672
TECHNOLOGY FOR THE CONTROL OF TICKS OF REGULATORY AND MEDICAL IMPORTANCE	921,649
TECHNOLOGY TO ENHANCE SOYBEAN OIL FOR FOOD AND NON FOOD USES	682,524
TESTING AND EXTENSION OF GPFARM:A DECISION SUPPORT SYSTEM FOR FARMERS AND RANCHERS	924,346
TESTING MINOR USE PESTICIDES ON FLORAL AND NURSERY CROPS	60,839
THE ADIPOSE TISSUE - BRAIN - PITUITARY AXIS	687,682
THE COLORADO POTATO BEETLE: BIOLOGY, BEHAVIOR AND NUTRITION	336,370

THE CONVERSION AND UTILIZATION OF AGRICULTURAL BY-PRODUCTS AS ADSORBENT MATERIAL	346,449
THE DEVELOPMENT OF PEST-RESISTANT LANDSCAPE TREES TO ENHANCE ENVIRONMENT & REDUCE USE OF PESTICIDES	748,710
THE EFFECT OF ENVIRONMENT ON GRAIN DEVELOPMENT, PRODUCTIVITY AND QUALITY IN WHEAT	999,944
THE EFFECT OF PLANT GENETICS AND ZINC ON CADMIUM CONCENTRATION AND BIOAVAILABILITY IN CROPS	222,667
THE IMPACT OF VITAMIN E AND SELENIUM IN HUMAN DISEASE PREVENTION	1,167,666
THE ROLE OF AGING IN ENERGY AND SUBSTRATE REGULATION & BODY COMPOSITION	1,628,213
THE ROLE OF COVER CROPS IN WEED MGMT AND SUSTAINABLE AGRICULTURE	630,253
THE ROLE OF LIFE STRATEGIES OF PHYTOPATHOGENIC BACTERIA IN THE EPIDEMIOLOGY OF FOLIAR DISEASES	212,538
THE ROLE THAT OXIDATIVE STRESS PLAYS IN ELEVATING RISK-FACTOR METABOLITES ASSOCIATED W/HEART DISEASE	315,282
THE ROLE(S) OF HEAT SHOCK PROTEINS IN THE RESPONSE OF PLANTS TO STRESS	265,109
THE USDA NATIONAL NUTRIENT DATABANK: ACQUISITION, EVALUATION & COMPILATION OF FOOD COMPOSITION DATA	2,758,193
THE USE OF ATOXIGENIC STRAINS OF ASPERGILLUS FLAVUS TO PREVENT AFLATOXIN CONTAMINATION	250,000
THERMOMECHANICAL PROCESSING OF NATURAL POLYMERS	1,032,087
TRANSMISSIBLE SPONGIFORM ENCEPHALOPATHIES OF ANIMALS AND RETROVIRAL DISEASES	1,248,663
TRANSPORT OF WATER AND CHEMICALS AS AFFECTED BY LANDSCAPE FEATURES AND MANAGEMENT	505,373
TREATMENT AND CO-UTILIZATION OF ANIMAL MANURE, ORGANIC RESIDUALS AND INORGANIC BY-PRODUCTS	803,123
TREATMENT AND HANDLING OF ANIMAL MANURE TO PREVENT PATHOGEN TRANSMISSION	604,209
TREATMENT OF ANIMAL MANURE TO PREVENT PATHOGEN TRANSMISSION	604,060
TREATMENT OF POULTRY MANURE TO PREVENT PATHOGEN TRANSMISSION	302,066
TROPICAL AQUACULTURE FEEDS AND CULTURE TECHNOLOGY: DEVELOPMENT OF SHRIMP FEEDS	1,602,978
UMBRELLA FOR FUNDING KENAF, FLAX, CRAMBE AND RAPESEED COOPERATIVE AGREEMENTS	106,238

UMBRELLA PROJECT FOR FOOD SAFETY	618,097
UNDERSTANDING HYDROLOGIC PROCESSES AT LANDSCAPE & WATERSHED SCALES	279,880
UPGRADING OF CITRUS PROCESSING WASTE TO VALUE-ADDED PRODUCTS	428,351
UPLAND SOIL EROSION RESEARCH: PROCESSES, CONTROL, AND PREDICTION FOR AGRICULTURAL WATERSHEDS	1,622,121
USDA ANIM HORMONE PROGRAM & THE FUNCTION OF GENES REGULATING TURKEY EGG PRODUCTION & EMBRYOGENESIS	865,959
USDA ARS PLANT GENOME MAPPING OF CROP PLANTS & FOREST TREES	1,622,648
USE OF HOST PLANT RESISTANCE TO MANAGE THE SOYBEAN CYST NEMATODE	182,437
USING MOLECULAR AND TRADITIONAL APPROACHES FOR THE INHERITANCE AND IMPROVEMENT OF CORN	274,586
UTILIZ. AND MANGT. OF TROPICAL FORAGES FOR BEEF HEIFER AND BULL DEVELOPMENT IN THE SUBTROPCIAL US	609,637
UTILIZATION OF FUEL ETHANOL RESIDUES FOR VALUE-ADDED CO-PRODUCTS	563,370
UTILIZATION OF PECTIN FROM FRUIT, SUNFLOWER, AND SUGARBEET	926,523
UTILIZATION OF WASTE AND BYPRODUCTS FROM AQUACULTURE TO ENHANCE ECONOMIC....SUSTAINABILITY	537,090
UTILIZING PLANT RESISTANCE TO INSECTS IN WHEAT AND BARLEY	581,183
UTILIZING TRANSPOSON-TAGGING TO ISOLATE & CHARACTERIZE AGRONOMICALLY IMPORTANT GENES FROM CORN	244,819
VALUE-ADDED PRODUCTS FROM PERENNIAL LEGUMES	419,532
VEGETABLE AND ORNAMENTALS RESEARCH	637,507
VIRAL AND BACTERIAL DISEASES OF HONEY BEES	659,573
VIRULENCE & HOST RANGE GENES OF AFRICAN SWINE FEVER VIRUS	2,052,819
VIRULENCE DETERMINANTS IMPORTANT TO PATHOGENESIS OF NEWCASTLE DISEASE VIRUS AND AVIAN PNEUMOVIRUS	1,159,981
VIRUS AND VIRUS-LIKE DISEASES OF VEGETABLES	251,147
VIRUS, VECTOR AND HOST FACTORS INFLUENCING THE TRANSMISSION OF BARLEY YELLOW DWARF LUTEOVIRUSES	235,150
VIRUS-INDUCED REPRODUCTIVE DISEASES OF SWINE	978,680
WATER CONSERV & WATER QUALITY AS IMPACTED BY MANAGEMENT & ARS MODULAR MODELG FRAMEWK FOR AG SYS	1,256,167
WATER CONSERVATION AND AVOIDANCE OF SALINE DAMAGE IN AGRICULTURAL IRRIGATION AND DRAINAGE	251,147

WATER PROJECT MANAGEMENT	858,651
WATER PUMPING AND ELECTRICAL POWER GENERATION USING RENEWABLE ENERGY	231,450
WATER QUALITY FUNCTIONS OF MANAGED, RESTORED AND NATURAL RIPARIAN ECOSYSTEMS IN AGRIC. WATERSHEDS	398,511
WEED CONTROL AND MICROBIOLOGY IN GRASSES GROWN FOR SEED	535,762
WESTERN INTEGRATED CROPPING SYSTEMS RESEARCH	1,157,049
WHEAT GENETICS AND IMPROVEMENT	312,047
WHEAT QUALITY: DETERMINATION AND CHARACTERIZATION	1,021,590
WILD RICE BREEDING AND GERMPLASM IMPROVEMENT	246,209
WIND EROSION AND AIR QUALITY PREDICTION, MANAGEMENT AND TECHNOLOGY	481,128
WIND EROSION PROCESSES, ASSESSMENT, AND CONTROL	1,035,351
WIND EROSION PROCESSES, FUGITIVE DUST EMISSIONS, AND MITIGATION STRATEGIES	717,619
YEAR-ROUND PRODUCTION OF HYBRID STRIPED BASS AND CONTROL OF BIRD PREDATION & TREMATODES IN FISH	912,151

OBJECT CLASS TABLE

Mr.Skeen: Please provide a breakout of the Other Services-Object Class 25.2 for fiscal years 1999, 2000, and 2001.

[The information follows:]

	FY 1999	FY 2000	FY 2001
25.2 Other Services:			
Reimbursement for Admin. Support	-$9,404,135	-$10,000,000	-$10,000,000
NFC Agency Specific (Reimb.) costs	350,925	400,000	400,000
Training/Tuition Fees. Etc . .	1,851,079	2,350,000	2,350,000
Fees and Other Charges . . .	291,599	350,000	350,000
Participation Fees	88,014	150,000	150,000
Construction Contracts	17,210	25,000	25,000
ARCH & Engineering Contracts .	6,830,266	8,500,000	8,500,000
Insurance Claims and Indemnities	257,143	300,000	300,000
Security Investigation Charges	47,474	60,000	60,000
Health Units	45,431	50,000	50,000
Bank Services Fees and Other Fees	52,477	60,000	60,000
Consultant Fees	51,214	60,000	60,000
Net Miscellaneous Adjustments .	2,469,303	6,698,000	9,213,000
Subtotal	2,948,000	9,003,000	12,118,000
Buildings and Facilities . . .	52,976,000	64,900,000	58,500,000
Total	55,924,000	73,903,000	70,618,000

COOPERATIVE AGREEMENTS

Mr. Skeen: Please provide a list of specific cooperative agreements with

state institutions for fiscal year 1999 and 2000.

[The information follows:]

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
FUNDING PROVIDED FOR
SPECIFIC COOPERATIVE AGREEMENTS WITH STATE INSTITUTIONS
FY 1999 FINAL
and
FY 2000 as of 3/13/2000

COOPERATOR	CITY, STATE	FY 1999	FY 2000* as of 3/13/00
Alabama Agri & Mech College	Normal, AL	$27,000	--
Alcorn State University	Lorman, MS	494,609	40,000
Arizona State University	Tempe, AZ	25,000	15,000
Arkansas Children's Hosp. (Univ of AR)	Little Rock, AR	3,710,880	3,588,388
Auburn University	Auburn, AL	427,854	30,000
California State University	Fresno, CA	750	--
Central MO State College	Warrensburg, MO	29,673	--
Clemson University	Clemson, SC	103,256	--
Colorado State University	Fort Collins, CO	896,547	--
Cornell University	Geneva, Ithaca, NY	2,007,514	73,119
Delaware State University	Dover, DE	48,750	--
Delta Center Ag Exp Station	Portageville, MO	7,500	--
Delta State College	Cleveland, MS	20,000	--
Duke University	Durham, NC	73,415	18,500
E. Montana Ag Exp Station	Sidney, MT	35,000	--
Florida Int'l University	Miami, FL	80,413	--
Howard University	Washington, D.C.	687	--
Illinois Ag Exp Station	Urbana, IL 20,000	--	
George Mason University	Fairfax, VA	16,000	--
Georgia Coastal Plain Exp Sta	Tifton, GA	73,125	--

*The FY 2000 amount reflects cooperative agreements entered into through 3/13/00 and not the final cost that may be incurred as of 9/30/2000.

COOPERATOR	CITY, STATE	FY 1999	FY 2000* as of 3/13/00
Iowa State University	Ames, IA	453,012	--
Johns Hopkins University	Baltimore, MD	413,299	--
Kansas State University	Manhattan, KS	843,928	--
Langston University	Langston, OK	75,000	--
Louisiana State University	Baton Rouge, LA	765,959	16,000
Memphis State University	Memphis, TN	28,000	--
Mercer University	Atlanta, GA	17,128	--
Michigan State University	East Lansing, MI	693,090	62,245
Miss Ag & Forestry Exp Sta	MS State, MS	2,599,347	12,500
Mississippi State University	MS State, MS	1,204,467	65,000
Montana State University	Bozeman/ Corvallis, MT	166,131	11,000
Morehouse College	Atlanta, GA	55,000	--
New Mexico State University	Las Cruces, NM	658,875	130,000
North Carolina State Univ.	Raleigh, NC	575,131	167,726
North Central Agri Exp St.	Grand Rapids,MN	205,451	206,427
North Dakota State Univ.	Fargo/Streeter, ND	1,424,530	132,488
Ohio State University	Wooster/ Columbus, OH	428,780	48,750
Oklahoma State University	Stillwater, OK	542,814	142,500
Oregon State University	Corvallis/ Pendleton, OR	784,942	79,225
Pan American University	Edinburg, TX	38,400	--
Pennington Biomed Res Ctr (LSU)	Baton Rouge, LA	350,000	599,437
Pennsylvania State Univ.	University Park,PA	193,973	34,508
Purdue University	W. Lafayette, IN	2,112,072	7,995
Rodale Institute Res Ctr (PSU)	Kutztown, PA	59,258	--
South Dakota State Univ.	Brookings, SD	324,782	--
Southern Univ & A&M College	Baton Rouge, LA	350,000	--

COOPERATOR	CITY, STATE	FY 1999	FY 2000* as of 3/13/00
State University of New York	Syracuse, NY	33,000	--
SW Missouri State University	Mountain Grove, MO	2,690	--
Tennessee State University	Nashville, TN	10,000	--
Texas A&M Research Foundation	College Station,TX	27,000	--
Texas A&M University	College Station/ Lubbock/Weslaco, TX	1,698,128	212,650
Texas Ag Exp Station	Lubbock, TX	4,330	--
Texas Tech University	Lubbock, TX	118,342	80,351
Tulane University	New Orleans, LA	244,263	--
Tuskegee University	Tuskegee, AL	240,731	--
University of Alaska	Fairbanks, AK	1,171,928	--
University of Arizona	Tucson/Yuma, AZ	130,500	45,000
University of Arkansas	Fayetteville/Pine Bluff, AR	599,211	300,000
University of California	Davis/Berkley/ Parlier/Riverside, CA	3,808,165	197,633
University of Central OK	Edmond, OK	6,704	--
University of Delaware	Newark, DE	8,500	--
University of Florida	Homestead/ Gainesville/ Belleglade, FL	1,403,414	127,573
University of Georgia	Athens/Griffin, GA	370,182	55,000
University of Hawaii	Honolulu, HI	1,468,420	484,697
University of Idaho	Aberdeen/Moscow/ Twin Falls/Parma, ID	429,086	60,200
University of Illinois	Urbana, IL	476,455	50,000
University of Kentucky	Lexington, KY	43,356	--
University of Maine	Orono, ME	51,606	74,101
University of Maryland	College Park/ Queenstown, MD	1,466,170	97,940
University of Maryland Eastern Shore	Princess Anne, MD	63,750	--

COOPERATOR	CITY, STATE	FY 1999	FY 2000* as of 3/13/00
University of Minnesota	St. Paul/ Minneapolis, MN	372,813	131,049
University of Mississippi	University, MS	2,668,123	1,252,527
University of Missouri	Columbia, MO	1,114,937	8,630
University of Nebraska	Lincoln, NE	564,358	--
University of Nevada	Reno, NV	12,000	14,000
University of North Dakota	Grand Forks, ND	26,259	28,000
University of Oklahoma	Oklahoma City, OK	80,000	18,400
University of Pennsylvania	Kennett Sq., PA	23,300	--
University of Puerto Rico	Rio Piedras, PR	40,000	--
University of SW Louisiana	Lafayette, LA	19,500	--
University of Southern MS	Hattiesburg, MS	350,000	300,000
University of Tennessee	Knoxville, TN	262,561	--
University of Texas	Dallas, TX	100,000	--
University of Utah	Salt Lake City, UT	75,000	--
University of Vermont	Burlington, VT	135,000	--
University of Virginia	Charlottesville, VA	10,000	--
University of Wisconsin	Madison/ Steven Point, WI	482,602	18,038
University of Wyoming	Laramie, WY	81,378	--
Utah State University	Logan, UT	171,000	--
Virginia Military Institute	Lexington, VA	20,165	--
Virginia Poly Inst & State University	Blacksburg, VA	92,524	--
Virginia State University	Petersburg, VA	21,450	--
Washington State University	MtVrn/Prosser/ Pullman/, WA	797,637	195,627
West Texas A&M College	Canyon, TX	6,000	--
West Virginia University	Morgantown, WV	405,000	--
Yale University	New Haven, CT	545,791	376,999
	TOTAL	45,814,671	9,609,223

LAPSED SALARIES

Mr. Skeen: How were the funds accrued through lapsed salaries from fiscal year 1999 used?

Response: The expenditure for fiscal year 1999 lapsed salaries will be provided for the record.

[The information follows:]

Use of Funds	FY 1999 Funds (in thousands)
Research Program Priorities	$9,839.7
Research Equipment	1,402.8
Repair and Maintenance of Facilities	600.0
Subtotal	$11,842.5

Note: The subtotal of $11,842,500 represents 60 percent of the total lapse salary accrual which was managed from ARS Headquarters. The 40 percent balance of the accrued lapsed salaries were retained and used by local managers to directly support research programs and operating needs. The primary uses of these funds were for research equipment, employee relocations, facilities repair and maintenance, safety and health improvements, and unanticipated operating needs.

FOOD SAFETY RESEARCH

Mr. Skeen: For the record, please provide a table showing each location for ARS funding for food safety, breaking out pre-harvest and post-harvest and other sub-categories of this research separately, similar to the breakdown shown on pages 85 and 86 of Conference Report 106-354. Include what was spent in fiscal year 1999, and what is anticipated for fiscal year 2000 and 2001.

[The information follows:]

FY 1999/2000/2001 PRE-HARVEST/POST-HARVEST FOOD SAFETY RESEARCH

Location	FY-1999			FY-2000			FY-2001		
	Pre-Harvest	Post-Harvest	Total	Pre-Harvest	Post-Harvest	Total	Pre-Harvest	Post-Harvest	Total
Fayetteville, AR	293,800		293,800	549,200		549,200	549,200		549,200
Phoenix, AZ	--	--	--	500,000		500,000	500,000		500,000
Albany, CA	2,719,800	5,015,000	7,734,800	2,771,400	5,510,000	8,281,400	2,771,400	6,210,000	8,981,400
Riverside, CA	592,800		592,800	604,200		604,200	604,200		604,200
Athens, GA	6,895,500	3,075,600	9,971,100	8,377,300	3,920,500	12,297,800	9,337,300	4,580,500	13,917,800
Dawson, GA	745,600		745,600	759,400		759,400	759,400		759,400
Tifton, GA	564,500		564,500	576,500		576,500	576,500		576,500
Ames, IA	4,215,400		4,215,400	4,996,200		4,996,200	5,396,200		5,396,200
Peoria, IL	4,465,500	434,100	4,899,600	5,036,900	442,300	5,479,200	5,336,900	442,300	5,779,200
West Lafayette, IN	296,400		296,400	551,900		551,900	551,900		551,900
New Orleans, LA	2,935,900	103,100	3,039,000	2,995,700	104,700	3,100,400	2,995,700	104,700	3,100,400
Beltsville, MD	4,732,600	3,435,800	8,168,400	5,188,900	3,902,400	9,091,300	5,488,900	4,902,400	10,391,300
Beltsville, MD (NAL)	109,800	109,800	219,600	111,100	111,100	222,200	111,100	311,100	422,200
Mississippi State, MS	669,100		669,100	1,183,600		1,183,600	1,183,600		1,183,600
Stoneville, MS	--	--	--	500,000		500,000	500,000		500,000
Raleigh, NC		491,800	491,800		501,900	501,900		501,900	501,900
Fargo, ND	2,296,100		2,296,100	2,342,200		2,342,200	2,342,200		2,342,200
Clay Center, NE	2,013,500	1,865,600	3,879,100	3,007,300	1,898,300	4,905,600	3,007,300	1,898,300	4,905,600
Lincoln, NE	--	--	--	250,000		250,000	250,000		250,000
Ithaca, NY	316,200		316,200	322,300		322,300	322,300		322,300
Wyndmoor, PA		13,245,900	13,245,900		14,789,400	14,789,400		15,089,400	15,089,400
Bushland, TX	--	--	--	250,000		250,000	250,000		250,000
College Station, TX	3,925,600	797,000	4,722,600	4,081,300	811,400	4,892,700	4,681,300	811,400	5,492,700
Lubbock, TX	281,600		281,600	286,900		286,900	586,900		586,900
Logan, UT	2,147,300		2,147,300	2,189,500		2,189,500	2,189,500		2,189,500
Pullman, WA	--	--	--	605,600		605,600	605,600		605,600
Headquarters	861,200	215,700	1,076,900	871,600	1,836,400	2,708,000	871,600	1,581,400	2,453,000
TOTAL	41,078,200	28,789,400	69,867,600	48,909,000	33,828,400	82,737,400	51,769,000	36,433,400	88,202,400

Mr. Skeen: What major areas of the food safety research program will be expanded or enhanced by the additional $11 million provided in fiscal year 2000 and requested $5.7 million increase in fiscal year 2001?

Response: Major areas of food safety research being expanded and enhanced in fiscal year 2000 are manure handling and distribution, antibiotic resistance, risk assessment, fungal toxins, zoonotic disease risk and aflatoxin, pathogen control in fruits/vegetables, pathogen control during slaughter/processing, antimicrobial resistance, *Listeria monocytogenes* and *E.coli* pathogens, and food safety engineering. Areas of food safety research to be expanded and enhanced by the requested $5.7 million increase in fiscal year 2001 are antibiotic resistance, control of pathogens during preslaughter and transportation, control of salmonella enteritidis, control of heavy metals and plant toxins, control of pathogens in fruits and vegetables, pathogen control in meat and poultry, pathogen and residue detection during processing and storage, and the food safety database.

HUMAN NUTRITION RESEARCH

Mr. Skeen: For the record, please provide a table showing each location for ARS funding of human nutrition research, and how much funding was spent in fiscal year 1999 and what is anticipated for fiscal years 2000 and 2001.

[The information follows:]

Human Nutrition

Location	FY 1999 Estimated	FY 2000 Estimated	FY 2001 Estimated
Arkansas Children's Hospital Research Institute, Little Rock, AR	$3,519,500	$4,019,500	$8,019,500
Western Human Nutrition Research Center, Davis, CA	5,717,200	6,317,400	8,417,400
Jean Mayer USDA Human Nutrition Research Center on Aging, Boston, MA	15,159,000	15,663,900	17,366,900
Beltsville Human Nutrition Research Center, Beltsville, MD	19,609,900	20,487,200	25,287,200
Grand Forks Human Nutrition Research Center, Grand Forks, ND	8,351,700	8,991,600	10,591,600
Children's Nutrition Research Center, Houston, TX	11,691,700	12,192,100	15,042,100
National Agricultural Library	675,000	675,000	675,000

Lower Mississippi Delta Intervention Research Initiative, (LA, AR, MS)	3,147,700	3,151,300	3,151,300
Other Locations	1,249,300	1,597,000	1,897,000
Totals	69,121,000	73,095,000	90,448,000

Mr. Skeen: Please describe for the record the type of research carried out at each of the Centers and some of the 1999 accomplishments of each center.

Response: The types of research carried out at each of the Centers are as follows:

Arkansas Children Nutrition Research Center, Little Rock, Arkansas, determines nutrient requirements for the maintenance of cognitive and behavior functions in children; and determines the health consequences of infant consumption of phytochemicals (biologically active compounds found in vegetables, grains and fruits) on their development and the prevention of chronic diseases.

Western Human Nutrition Research Center, San Francisco, California, determines the impacts of dietary, environmental, behavioral, and genetic factors on nutrient requirements and functions with emphasis on maintenance of healthy body weight, infection and immune disorders, and protective factors in food; and designs and tests strategies for nutrition interventions for use in national action programs.

Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts, determines factors related to prevention of age-related loss of bone density leading to osteoporosis and fracture, and the preservation of muscle strength; identifies dietary factors critical in slowing or preventing cataract development; studies the relation of antioxidant food components to heart disease and immune function; and explores relationships between vitamins and brain function, stroke and dementia.

Beltsville Human Nutrition Research Center, Beltsville, Maryland, develops new methods of food analysis; studies the role of nutrients and their interactions in maintaining health; conducts nutrition monitoring and maintains the database of the nutrient content of foods; studies the expenditure of energy by using direct and indirect calorimetry; and conducts studies investigating the consequences of altered nutrient intakes in humans.

Grand Forks Human Nutrition Research Center, Grand Forks, North Dakota, determines the importance of mineral elements at the molecular level with an emphasis on chronic disease; identifies detrimental functional changes, especially in bone, brain, cardiovascular and reproductive systems that occur in the U.S. population because of improper mineral element nutriture; identifies and validates biochemical and physiological status assessment indicators that can be used in the study of populations that are likely to suffer from inadequate mineral element nutrition; and defines the impact of environmental, dietary, physiological and psychological stressors on mineral element requirements.

Children's Nutrition Research Center, Baylor College of Medicine, Houston, Texas, establishes nutrient requirements to prevent low birth weight babies, particularly in pregnant adolescents; studies nutrient-gene interactions that regulate metabolism and disposition of nutrients; determines nutrient requirements for growth and development of school-aged and adolescent children; and establishes nutritional connections to acute and chronic childhood diseases.

Some recent accomplishments include:

Arkansas Children's Human Nutrition Research Center, Little Rock, Arkansas

Nutritional status at a very early age may have a major impact on cognition and brain function. Researchers at the Arkansas Children's Nutrition Center showed that children with suspected nutrition deficits as infants exhibit a greater range of emotion on temperament scales, have more toys in the home, and have lower plasma ferritin, calcium, sodium, and magnesium levels. When these children are older, the data suggest that they are deficient in academic skills, i.e. symbol search, IQ, reading, arithmetic, and longer latencies on the right side of their brains than on the left side in tasks which compare the recognition of congruent works with anomalous letters (pattern recognition). This later error can translate into deficiencies with acquisition skills, such as language acquisition. Demonstrates importance of diet at a very young age.

Factors in soy protein isolate may reduce the incidence of breast and colon cancer. Data from rat studies conducted at the Arkansas Children's Nutrition Center suggest that soy protein isolate, the sole protein source of most soy infant formulas, can reduce the incidence of breast cancer and colon cancer, and can improve metabolism. The rats have leaner body composition, greater metabolic capacity towards xenobiotics such as medications and carcinogens, 25% lower risk of developing chemically-induced breast cancer, and 80% lower risk of developing chemically-induced colon cancer. Similarly, a modified version of the common whey protein found in milk can provide even more protection against breast cancer and also protect against colon cancer.

Western Human Nutrition Research Center, San Francisco, California

Requirement for dietary choline is partly dependent on the folate intake. Choline is a nutrient that is needed for growth of healthy cells and production of the neurotransmitter, acetylcholine. The body can make its own choline, but studies at the Western Human Nutrition Research Center have shown that the body could not make enough choline when dietary folate and choline intakes were low, probably because choline was being used to make up for the lack of folate in the diet. This has been shown in post-menopausal women and similar results have been found in adult men. These data contributed to recent decisions to double the RDA for folate from 200 to 400 micrograms per day and to recommend for the first time an Adequate Intake for choline of 425 and 550 milligrams per day for women and men, respectively. The findings also raise the converse question of whether the dietary requirement for folate may depend on choline intake. This has potentially great significance in that the recent doubling of the folate RDA, and mandate to fortify U.S. grain products with folic acid, stems from the newly recognized roles of folate in preventing neural tube birth defects and elevated blood homocysteine levels (a risk factor for heart disease). So the body's folate status may depend not only on how much folate, but how much choline we consume.

Dieters may experience a more efficient return to the resting metabolic state following periods of activity. There is considerable controversy surrounding the claim that the practice of dieting results in a drop in metabolic rate that, in turn, contributes to the difficulty of sustaining weight loss. Investigators at the Western Human Nutrition Research Center have found that a brief dieting episode of 3 days was not associated with a significant decrease in metabolic rate in the basal state, but it did lead to decreased metabolic rate in the first hour during recovery from moderate intensity exercise. This phenomenon may contribute to the conservation of energy during periods of restricted energy intake.

Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts

Fortification of folate has reduced the prevalence of low circulating folate and high homocysteine concentrations. The implementation of the FDA-mandated folic acid fortification of enriched grain products was completed by early 1998. Researchers at the Human Nutrition Research Center on Aging at Tufts University assessed the impact of fortification on the folate status of adult Americans. They have conducted a long-term follow-up of folate and homocysteine concentrations in the population-based Framingham Heart Studies. This work indicated that the current levels of fortification were able to reduce the prevalence of low circulating folate and high homocysteine concentrations to levels seen in multivitamin supplement users. This was the first demonstration of the effectiveness of this important national program.

Vitamin K may be a modifiable risk factor for osteoporosis. Researchers at the Human Nutrition Research Center on Aging at Tufts University in collaboration with Framingham Osteoporosis Study researchers evaluated associations between dietary vitamin K intake, apoE genotype, bone mineral density and rate of hip fracture among elderly men and women participating in the original cohort of the Framingham Heart Study. Low vitamin K intakes were significantly associated with increased incidence of hip fractures in men and women. In contrast, neither low intakes of vitamin K nor apoE4 allele were associated with low bone mineral density.

Beltsville Human Nutrition Research Center, Beltsville, Maryland

Rapid method for determination of selenomethionine in foods and dietary supplements developed. There is a need for developing techniques to determine food components and establish food composition databases to allow nutritionists to make prudent recommendations for consumption. Selenium deficiency has been linked to vascular disease including myocardial infarction. Dietary selenium can have both beneficial and toxic effects, occurring in both inorganic and organic forms. The efficiency of absorption of selenium is dependent on the chemical form. A stable isotope dilution method was developed for the rapid determination of selenomethionine in foods and dietary supplements by researchers at the Beltsville Human Nutrition Research Center. One important finding using this method is that food label claims for added selenium in the form of selenomethionine are not always accurate.

Nutrient database for Standard Reference (SR), Release 13, developed. Research on the composition of the diet is one of the major components of the ARS National Program on Human Nutrition. Expansion of the Nutrient Databank to reflect more contemporary patterns of food consumption as well as to provide representative estimates for levels of components newly recognized by the scientific community as having potential benefits for public health is essential. The Nutrient Database for SR 13 has been developed by investigators at the Beltsville Human Nutrition Research Center and was released in November 1999. SR 13 provides estimates of composition for up to 82 components and 6,210 foods. This is the major product of the National Nutrient Databank System and provides the basis of all other food composition databases, including government, private sector, and academia. It is available on the web, www.nal.usda.gov/fnic/foodcomp.

Potential for newly developed barley cultivar to be used in dietary control of type 2 diabetes. Consumption of oats has been recognized as promoting beneficial reductions in glucose and insulin responses and cholesterol levels. The high soluble fiber content of oat has been determined to be a major factor in the beneficial reduction. Barley also has high amounts of soluble fiber,

but had not been studied for its potential for reducing glucose or insulin response after a meal as extensively as oats. A new barley cultivar has been developed which has three times the amount of beta glucan found in standard oats. Researchers at the Beltsville Human Nutrition Research Center gave adult women test meals containing either oat flour, oatmeal, barley flour or barley cereal. Data showed that the high soluble fiber barley was effective reducing both insulin and glucose responses. These results demonstrate the potential use for this grain high in soluble fibers in dietary control of insulin independent diabetes mellitus (type 2).

Grand Forks Human Nutrition Research Center, Grand Forks, North Dakota
Micronutrients

Less toxicological risk from selenium found in broccoli. Broccoli may contain a unique and beneficial form of selenium but little is known about its metabolism. Researchers at Grand Forks Human Nutrition Research Center determined the effectiveness of high-selenium broccoli in restoring tissue selenium concentrations and selenoprotein activities. Rat studies showed that selenium from broccoli accumulated slower and did not increase selenoprotein enzyme activity as well as other forms of selenium. Because these studies indicated that the selenium from broccoli may not pose as much of a toxicological risk as other forms of selenium and may be a means of supplementing selenium, a study was conducted to determine how humans metabolize selenium from broccoli. Broccoli loaded with a stable isotope of selenium was fed to humans. Selenium from broccoli did not accumulate in the plasma as much as selenium from a salt, but less was excreted in the urine. These results indicate that selenium from broccoli may not pose much of a toxicological risk to humans because it does not accumulate in tissues to the extent that other forms of selenium do.

Increased understanding of the role of copper nutriture in cognitive function. Research at the Grand Forks Human Nutrition Research Center showed that diets moderately high in zinc (50 mg/day) can impair short-term memory of healthy postmenopausal women eating a low copper diet (1 mg/day) as indicated by increased intrusions during verbal recall and reduced accuracy during immediate recall of numeric sequences. Few studies have examined the role of copper in cognitive function. Additional studies are planned to examine the relationship between dietary copper and cognitive function, including dementia, with the potential impact to affect recommended intakes and improve cognitive function in the elderly and other populations. Results also address the negative effects of high zinc intakes, known to reduce copper absorption and affect biochemical indices of copper status.

Children's Nutrition Research Center, Baylor College of Medicine, Houston, Texas

Key role of dietary amino acids in intestinal energy metabolism. The results of animal studies show that the overwhelming source of energy for the developing intestine of the milk fed neonate is dietary protein. The intestinal utilization of nonessential amino acids as energy sources appears to be obligatory while essential amino acid catabolism varies with intake. Parallel investigations show that skeletal muscle will readily interchange lipid and carbohydrate as sources of energy. In vivo studies of fuel selection in the mucosa of young pigs have also confirmed the key role of dietary amino acids in intestinal energy metabolism, even under conditions of restricted protein supply. This research is useful in understanding dietary needs of young infants.

Energy requirements of very young children lower than current recommendations for intake. From birth to 2 years of age the energy

requirements were found to be 15-27% lower than current recommendations for energy intake. Adjusted for weight, total energy expenditure and energy requirements differed by feeding group (breast-fed < formula-fed), but not by age or gender. Differences in body composition between feeding groups were seen during early infancy, but did not persist into the second year of life.

Benefit of human milk feeding. It is important to better understand factors that affect gastrointestinal growth and adaptation. It was shown that human milk feeding accelerates gastrointestinal development more than feeding with formula. Human milk feeding is associated with less infectious complications than formula feeding.

Mr. Skeen: Please provide a table showing the total USDA program for human nutrition research and education, including the NRI, special grants, Hatch Act, Smith-Lever, and other programs.

Response: The total research budgets for human nutrition in USDA will be provided for the record.
[The information follows:]

HUMAN NUTRITION RESEARCH, EDUCATION AND RELATED ACTIVITIES
(Dollars in Millions)

Human Nutrition Research and Monitoring Program

	1999 Actual	2000 Estimate	2001 Budget
Agricultural Research Service	$68.4	72.4	$89.7
CSREES-Research and Education	13.4	13.8	17.1
Economic Research Service	4.5	4.5	1.9
Total	86.3	90.7	108.7

Human Nutrition Education, Evaluation and Demonstrations

	1999 Actual	2000 Estimate	2001 Budget
Agricultural Research Service	$ 0.7	$ 0.7	$ 0.7
CSREES-Extension Activities	77.8	77.8	80.1
Food and Nutrition Service	274.2	276.5	304.3
Food Safety and Inspection Service	0.1	0.2	0.2
Economic Research Service	10.2	11.2	--
Total	363.0	366.4	385.3
TOTAL, Research, Education & Information	449.3	457.1	494.0

SWINE RESEARCH

Mr. Skeen: By location, please provide the dollars and staff devoted to swine research in fiscal years 1999, 2000, 2001.

[The information follows:]

Location	FY 1999	SY	FY 2000	SY	FY 2001	SY
Phoenix, AZ	--	--	$125,000	0.5	$125,000	0.5
Albany, CA	$108,700	--	--	--	--	--
Fort Collins, CO	--	--	65,600	0.2	128,100	0.4

Athens, GA	1,083,700	3.4	1,180,000	3.5	1,180,000	3.5
Ames, IA	7,322,500	13.8	7,715,300	22.9	7,775,300	22.9
Peoria, IL	241,000	1.1	762,500	2.4	579,600	2.4
West Lafayette, IN	193,500	0.8	780,600	2.4	780,600	2.4
Beltsville, MD	6,813,200	16.0	6,218,100	15.1	6,308,100	15.4
Columbia, MO	617,600	2.0	629,500	2.0	629,500	2.0
Mississippi State, MS	130,700	0.3	250,000	--	250,000	--
Fargo, ND	333,900	0.9	340,600	1.1	340,600	1.1
Clay Center, NE	5,420,500	18.6	5,593,000	17.9	5,833,000	18.7
Lincoln, NE	--	--	125,000	0.5	125,000	0.5
Greenport, NY	4,911,700	5.2	6,688,600	6.2	6,438,600	6.2
Wyndmoor, PA	1,849,300	5.2	1,964,200	6.0	2,054,200	6.0
Bushland, TX	--	--	75,000	0.3	75,000	0.3
College Station, TX	1,525,700	4.3	1,553,300	5.7	1,703,300	6.2
Lubbock, TX	84,500	--	86,000	0.3	176,000	0.6
Headquarters	64,400	--	54,600	--	54,600	--
Total	30,700,900	71.6	34,206,900	87.0	34,556,500	89.1

CENTERS OF EXCELLENCE

Mr. Skeen: Please update the Committee on your Centers of Excellence activity, providing us with any plans for new centers and highlights of accomplishments these centers have provided in fiscal year 1999, and goals for fiscal years 2000 and 2001.

Response: Through congressional funding in fiscal year 2000, a science center of excellence was established at Florida A&M University in Tallahassee. This new program is intended to enhance the science base of the university through faculty research support for collaboration with ARS.

ARS does not have plans to propose any new Centers of Excellence.

Accomplishments for fiscal year 1999 and Goals for fiscal years 2000 and 2001:

Center of Excellence for Swine Research and Marketing - Alcorn State University: Purchase of replacement breeding animals to provide improved animals and semen to limited-resource farmers. Approximately 240 animals of improved genetic quality have been sold to farmers in Mississippi and Louisiana for use in their herds. Construction was completed on the Animal Genetics Laboratory, and it is being used to train boars for semen collection. Renovations were completed on a finishing barn. A field day was held in June and approximately 90 farmers were in attendance. Demonstrations and presentations were provided on methods to improve swine production in the farmer's operations.

In fiscal year 2000 and 2001, research will be conducted to evaluate the

effect of feed additives on the amino acid balance and cholesterol levels in swine. The Center will continue providing gilts and semen to limited-resource swine producers. Finally, efforts will be continued to improve the research facilities.

Center of Excellence in Aquaculture - Delaware State University: During fiscal year 1999, studies were begun on the development of more rapid methods for the detection of infectious viruses and vibrio bacteria in shellfish, with emphasis on hepatitis A and Norwalk viruses using poliovirus as a model, and on *Vibrio vulnificus*. A collaborative study was completed that involved the National Ocean Service in Charleston, South Carolina, the Virginia Polytechnic Institute and State University in Blacksburg, Virginia, and the ARS Dover worksite. The collaboration focused on the use of pulsed field gel electrophoresis to identify sources of *E. coli* contamination that can affect molluscan shellfish safety.

For fiscal years 2000 and 2001, the laboratory will continue development of methods and strategies to improve the microbiological safety of aquaculture products. The anticipated products from this research will be more rapid virus and Vibrio detection techniques for oysters and clams, and improved processing strategies to reduce the threat of virus contamination in seafoods. The customer base for this project is diverse and includes State and Federal regulatory agencies; industry, particularly the Shellfish Institute of North America, the National Shell Fisheries Association, the Interstate Shellfish Sanitation Conference, the restaurant industry; and consumer groups such as the Center for Science in the Public Interest.

Center of Excellence in Aquaculture and Fisheries - University of Arkansas Pine Bluff: In fiscal year 1999 the following was accomplished: Current recommendations are to feed catfish every other day during hot weather. Results from a study comparing feeding every day to every other day feeding when water temperature was 90 F or warmer indicate that fingerlings grew 70 percent more when fed daily. The industry currently combines fingerlings from a growing season with older catfish from previous growing seasons. Research indicates that temporarily keeping larger catfish from newly stocked fingerlings improves overall pond yields. With the current harvesting systems, a number of catfish are to short to process and they become part of the waste product. In cooperation with University of Arkansas, aquaculture extension personnel, an in-pond food fish grader was used to separate out the catfish that were to short to process with 90 percent accuracy and with a through-put capacity of 25,000 lb/hr. The small sized catfish are left in the pond to continue growing.

In fiscal year 2000 and 2001 Plans include: research to further optimize the in-pond foodfish grader to separate out the catfish that are too short to process. Research will also be conducted on evaluating survival and yield of understocked fingerlings that have been temporarily separated and fed separately from the older fish. Studies will be conducted to determine the difference in catfish production in ponds that have catfish from one growing season (single batch) compared to ponds that have catfish from multiple growing seasons (multiple batch). The sensory quality, acceptability and market potential of canned bighead carp will be evaluated and develop the processing criteria. The ARS Catfish Strain 103 is an improved line of catfish that has been selected for increase production. The 103 strain will be evaluated at the Arkansas location. The current harvesting system uses a net to collect the catfish and they are funneled into a sock. The size of mesh on the sock determines the size of catfish that will be collected. Various sock grading strategies will be evaluated for removal of undersized fish in multiple batch ponds

Grassland Center of Excellence - Langston University, Oklahoma: The purpose of this center is to develop and implement more profitable and environmentally benign forage production systems for use by small livestock producers in the southern Great Plains and adjoining regions to the east. Two ARS scientists with support personnel are stationed on the Langston University campus to cooperate with the staff of the university's Grassland Center of Excellence and its Center for Outreach Programs under a Research Agreement established in 1998.

Accomplishments in fiscal year 1999 included completion of research program planning, establishment of an equipped laboratory on the campus for analysis of soil, water, and forage samples; and initiation of field experiments.

Goals for fiscal year 2000 and 2001 are to complete staffing of the ARS unit; implement a series of evaluations of new forage grasses and legumes with potential for use by small landholders; and implement a cooperative research plan on an experimental farm recently acquired by the university. In fiscal year 2000, ARS and the university's Grassland Center of Excellence will install fences, livestock watering facilities, and other infrastructure necessary to the development and demonstration of experimental forage/livestock production systems designed for small producers, which reduce costs of production and potential impacts of livestock production on soil and water quality. These model "production systems" will be established on independent 100-acre units of the experimental farm in fiscal year 2001 and monitored over time to provide assessments of productivity, profitability, and environmental impacts.

Center of Excellence in Food Safety - University of Maryland, Eastern Shore: During fiscal year 1999, the laboratory developed and validated predictive models for growth of *Salmonella typhimurium* on cooked chicken breasts; established methodology for validating predictive models that involved assessment of model prediction accuracy and bias; surveyed serotypes of *Salmonella* spp. from chicken ceca for growth kinetics on cooked chicken breast; initiated studies with fluorescent *Salmonella* spp. to assess their utility for modeling growth of *Salmonella* spp. on chicken with competing microorganisms; developed simulation modeling methods for assessing exposure and response of consumers to human pathogenic bacteria of chicken; designed a farm-to-table model for assessing the risk and severity of *Salmonella* spp. and *Campylobacter jejuni* infections from chicken, and created a case study to demonstrate how the model can be used to make food safety decisions.

These results were incorporated into the ARS -- Poultry Food Assess Risk Model (Poultry FARM) where they can be used by the chicken industry and FSIS to assess the public health impact of individual lots of chicken destined for specific distribution channels and consumer populations; by scientists to plan experiments; and by consumers to assess the risk and severity of *Salmonella* spp. infections from cooked chicken subjected to temperature abuse. Currently, over 150 copies of Poultry FARM have been distributed to food safety professionals in the U.S. and foreign countries. The primary impact of Poultry FARM has been education of consumers, scientists, regulators, and food producers about the value of computer models as a tool for making food safety decisions.

For fiscal years 2000 and 2001, the laboratory will continue to develop predictive models to improve the microbiological safety of chicken. These models will enhance the risk assessment capabilities of the FSIS and industry to safeguard public health by; identifying high-risk food; identifying critical control points and evaluating the efficacy of intervention methods.

Center of Excellence at the Tennessee State University Nursery Crop

Research Station, McMinnville, Tennessee: The Tennessee State University Nursery Crop Research Station is the only research station in the nation dedicated solely to nursery crop research. Its mission is to provide leadership in the strengthening and expansion of the nursery industry through research in the area of genetics, breeding, horticulture, pathology, entomology and related sciences. This research laboratory is a model for cooperation between an 1890 Institution and ARS.

Cooperative research programs between ARS and TSU evaluated newly planted nursery crops for flat-headed apple borer infestations and identified sources of powdery mildew resistance in dogwood. The life-cycle of the flat-headed apple borer will be monitored to develop cultural and chemical protocols and studies involving the molecular analysis of powdery mildew resistance in dogwood will be initiated. A two-phase program was implemented by Carnegie-Mellon Robotic Institute, in cooperation with ARS, to design and build a robotic container handling tool for the nursery production. During fiscal year 2000, a prototype of the robotic handler will be built and tested at the McMinnville site and in various production nurseries in the United States.

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS (CRADA's)

Mr Skeen: Please update the Committee on your CRADA's, including number of agreements in place, recent accomplishments, and any problems associated with the program.

Response: At the end of fiscal year 1999, ARS had 298 active CRADAs. The program continues to provide an important mechanism to transfer technology from the research program to solve important agricultural problems. The development of ARS technologies has often benefitted small businesses and created new economic opportunities.

The following are a few examples of successful CRADAs and licenses:

A mosquito attract and control device was co-developed under a CRADA between the ARS Center for Medical, Agricultural and Veterinary Entomology in Gainesville, FL, and BioSensory, Inc., of Willimantic, CT. The patented trap lures mosquitoes with a blend of carbon dioxide, heat, and octenol, the same chemical cues that attract mosquitoes and other biting insects in nature. The trap can be used to monitor mosquito populations, and in certain situations to help control mosquito populations. For example, the use of these traps could be useful in monitoring the abundance of mosquitoes carrying human diseases such as the West Nile Virus. This trap does not use any chemical pesticides, so it is environmentally friendly. The small business that is manufacturing and marketing the trap received support from the State economic development program.

A diagnostic test that detects abnormal prion protein in sheep was developed by researchers at ARS' Animal Disease Research Unit in Pullman, WA. Additionally, this monoclonal antibody detects abnormal prion protein in tissues of many other animal species, including cattle, mule deer, elk, white tailed deer, and humans. An abnormal form of the prion protein is a diagnostic marker and the likely cause of many animal diseases, particularly mad cow disease in cattle and scrapie in sheep. It is the first practical live animal test for a prion disease. This test should be very beneficial in the control and eradication of scrapie in U.S. sheep, which costs $25 million annually in export market losses and sheep deaths. This monoclonal antibody has been licensed by two commercial companies and is currently being sold nationally and internationally.

A new approach to wound dressing is the result of technology developed at the ARS Southern Regional Research Center, Cotton Textile Chemistry Research Unit in New Orleans, LA. The scientists have developed a method to chemically modify cotton gauze that reduces the amount of tissue-destroying enzymes in wounds, which prevent them from healing quickly. This low-cost dressing made of cotton should help bedsores and other chronic wounds heal faster. Potential medical costs--resulting from slow healing wounds--per patient per year in the U.S. would be about $36,000. For patients using the ARS-developed "smart" wound dressing, the cost per patient per year would be reduced to about $12,000.

A new method to control honey bee pests using plastic strips impregnated with an insecticide has been developed. The strips, which hang inside the bee colony control two major honey bee pests, small hive beetles and varroa mites, which cost the beekeeping industry approximately $100 million annually in losses. Loss of bee pollinators would potentially affect the productivity of several major agricultural crops, including almonds, blueberries, cranberries, melons and many other fruits and vegetables. Researchers at the Beneficial Insects Research Unit in Weslaco, TX, developed this technology, which saved the beekeeping industry more than $50 million in 1999. This pest control technology is currently available in more than 40 states.

A nutritional supplement derived from rice bran has been developed which is a byproduct of the rice milling process. Rapid degradation of the oil content in rice bran limits its use for anything other than animal feed. This product is a rich source of nutritionally important components such as, vitamin E and other tocopherols. The combination of these tocopherols potentially offers several health benefits, like lowering cholesterol, promoting normal circulation, and protection from oxidation. Scientists at the ARS Southern Regional Research Center through a Cooperative Research and Development Agreement (CRADA) helped improve rice bran and its oil processing technology, allowing the commercialization of this nutritious product. This nutritional supplement product is trade marked as Evolve and marketed through K&B (now Rite Aid), Walgreen, and several WalMart stores.

A method has been developed to dye all-natural blends to the same depth and shade. The new single-step dyeing processes for wool/cotton blends was developed by researchers at ARS' Eastern Regional Research Center, Wyndmoor, PA and helps manufacturers overcome a major technological barrier: dyeing all-natural blends to the same depth of shade. These processes open new markets for domestic wool and cotton and were developed in collaboration with J.E. Morgan Knitting Mills Incorporated (Tamaqua, PA) and Cotton Incorporated (Raleigh, NC), both ARS research partners on this project.

A hand lotion was developed using starch and vegetable oil, which was discovered by researchers at ARS' National Center for Agricultural Utilization Research in Peoria, IL. The product has exceptional properties that allow it to be used as a base for a variety of personal care products, such as hand and body lotions and sun screens. ARS holds U.S. and foreign patents on the process for developing the product and the product itself. Transfer of this technology to the cosmetic field was accomplished through a CRADA with Hy-Gene Incorporated, a small U.S. biotechnology firm. Successful introduction of this product to the market place will provide additional uses for corn and other commodity crop starches and oils. The U.S. market for consumer skin care products is about $16-20 billion annually. Lotions account for about 15 percent of the market.

Mr. Skeen: How much will ARS receive in monies from its CRADA's in fiscal years 1999, 2000, and 2001?

Response: The monies that ARS will receive from its currently active CRADA's are as follows:

Fiscal Year 1999	$5,159,165	(actual)
Fiscal Year 2000	$5,500,000	(estimate)
Fiscal Year 2001	$5,500,000	(estimate)

PATENTS

Mr. Skeen: How many patents does USDA currently have and how many are currently pending?

Response: ARS currently has 520 issued patents and 224 patents are pending.

Mr. Skeen: Please submit a list in alphabetical order of all current patent licenses on products/processes that have been granted to industry partners since the establishment of CRADA's in 1986.

Response: USDA has granted a total of 635 licenses, of which 215 are currently active. A list of currently active licenses will be provided for the record.

[The information follows:]

(Z)-3-DODECEN-1-OL (E)-2-BUTENOATE AND ITS USE IN MONITORING AND CONTROLLING THE SWEETPOTATO WEEVIL

1, 24 DIHYDROXY VITAMIN D 2

A DUAL SIDE PLANT LEAF WASHER AND IMMERSION CELL

A METHOD FOR THE CONTROL OF INSECTS

A METHOD OF MAKING A SOLUBLE DIETARY FIBER COMPOSITION FROM OATS (2 Licenses)

A MULTIPLE EMBEDDED NUCLEAR POLYHEDROSIS VIRUS FROM CELERY LOOPER WITH ACTIVITY AGAINST LEPIDOPTERA

A PLASTIC BAIT COMPOSITION FOR ATTRACTING AND KILLING CROP PESTS

A TECHNIQUE TO REDUCE CHEMICAL USAGE AND CONCOMITANT DRIFT FROM AERIAL SPRAYS

ADHERENT SPRAY FORMULATIONS FOR PESTICIDES

ADHERENT STARCH GRANULES FOR ENCAPSULATION OF PEST CONTROL AGENTS

ADJUSTABLE FLUME

ALKALINE PEROXIDE TREATMENT OF NONWOODY LIGNOCELLULOSICS

APPARATUS FOR CLEANING COTTON

APRICOT CV. ROBADA (K106-2) (8 licenses)

ARTIFICIAL MEDIA FOR REARING ENTOMOPHAGES (4 Licenses)

ASPERNOMINE, AN ANTIINECTAN METABOLITE

ATTENUATED REVERTANT SEROTYPE 1 MAREK'S DISEASE VACCINE (2 Licenses)

ATTRACTANTS FOR THE ROSE CHAFER, MACRODACTYLUS SUBSPINOSUS (F)

AUTOMATED TENSION INFILTROMETERAVIAN INTERLEUKIN-2, HMW

AVIAN LEUKOSIS VIRUS SUBGROUP J HC STRAIN FOR DIAGNOSIS AND VACCINE

BACTERIA AND ENZYMES FOR PRODUCTION OF ALTERNAN FRAGMENTS

BIG BLUESTEM NIAGARA GRASS

BIOCONTROL AGENTS FOR TAKE-ALL

BIOCONTROL OF POSTHARVEST ROTS IN FRUIT

BIODEGRADABLE POLYESTER COMPOSITIONS WITH NATURAL POLYMERS AND ARTICLES THEREOF

BIOLOGICAL CONTROL OF DISEASES OF HARVESTED AGRICULTURAL COMMODITIES USING STRAINS OF THE YEAST CANDIDA SAKE

BIOLOGICAL CONTROL OF POSTHARVEST DISEASES OF POME FRUIT WITH PSEUDOMONAS SYRINGAE PV. LACHRYMANS

BIOLOGICAL CONTROL OF POSTHARVEST ROTS IN FRUITS USING DEBARYOMYCES HANSENII

BIOPESTICIDE COMPOSITION AND PROCESS FOR CONTROLLING INSECT PESTS

BOLL WEEVIL TRAP

BRUCELLA ABORTUS ANTIBODY DETECTION METHODS

CALCIUM FORMULATIONS FOR PREVENTION OF PARTURIENT HYPOCALCEMIA

CANKER-RESISTANT ASPEN TREE 70-144-30-68-1

CARCASS CLEANING UNIT

CATALYSTS AND PROCESSES FOR FORMALDEHYDE-FREE DURABLE PRESS FINISHING OF COTTON TEXTILES WITH POLYCARBOXYLIC ACIDS (3 Licenses)

CHARLESTON GREENPACK COWPEA

CHEMICAL ATTRACTANTS FOR YELLOWJACKETS AND PAPER WASPS

CLONED GENE AND METHOD FOR MAKING AND USING THE SAME

COMPOSITION AND METHOD FOR THE CONTROL OF PARASITIC MITES IN HONEY BEES

COMPOSITIONS AND METHODS FOR BIOCONTROL USING FLUORESCENT BRIGHTENERS

COMPOSITIONS FOR THE CONTROL OF PEPPER WEEVILS

CONSTRUCTION OF PASTEURELLA HAEMOLYTICA AND PASTEURELLA MULTOCIDA AND HAEMOPHILUS VACCINES

CONTINUUM SOURCE ATOMIC ABSORPTION SPECTROMETRY

CONTROL OF PESTS WITH ANNONACEOUS ACETOGENINS

CORN FIBER OIL - ITS PREPARATION AND USE

COWPEA, 'PETITE-N-GREEN

DEVELOPMENT OF A NOVEL TRAPPING SYSTEM FOR FRUIT FLIES (2 Licenses)

DEVICE FOR AUTOMATIC EXTRACTING, GRADING AND RETURNING LINT TO GIN SYSTEM

DIAGNOSTIC ASSAYS FOR GENETIC MUTATIONS ASSOCIATED WITH BOVINE LEUKOCYTE ADHESION DEFICIENCY (2 Licenses)

DIETARY SUPPLEMENTATION WITH ESSENTIAL METAL PICOLINATES (2 Licenses)

DISEASE CONTROL IN AVIAN SPECIES BY EMBRYONAL VACCINATION

DNA RECOMINATION IN EUCARYOTIC CELLS BY THE BACTERIOPHAGE PHIC31 RECOMINATION SYSTEM

DNA SEQUENCES ENCODING SOLANIDINE UDP-GLUCOSE GLUCOSYLTRANSFERASE AND USE TO REDUCE GLYCOALKALOIDS IN SOLANACEOUS PLANTS

DNAS ENCODING MOSQUITO OOSTATIC HORMONE

DWARF BAHIAGRASS WITH A LIMITED FLOWERING CAPACITY AND SHORT INFLORESCENSES

ELECTROSTATIC DUST REDUCTION SYSTEM FOR REDUCING AIRBORNE DUST AND MICROORGANISMS

ENHANCED INSECT RESISTANCE IN PLANTS GENETICALLY ENGINEERED WITH A PLANT HORMONE GENE INVOLVED IN CYTOKININ BIOSYNTHESIS

ENHANCEMENT OF NITROGEN FIXATION WITH BRADYRHIZOBIUM JAPONICUM MUTANTS

FIBER AND FIBER PRODUCTS PRODUCED FROM FEATHERS (3 Licenses)

FOOD STUFFS CONTAINING STARCH OF A NORMAL SUGARY-2 GENOTYPE

FUNGAL COMPOSITIONS AND METHODS FOR BIOREMEDIATION

FUNGAL GENE ENCODING RESISTANCE TO THE PHYTOTOXIN CERCOSPORIN

GRAZER ANNUAL RYEGRASS

GRAZING REPELLENT FOR GEESE AND SWANS

GREEN LEAF VOLATILES AS INHIBITORS OF BARK BEETLE AGGREGATION PHEROMONES

GREENHOUSE ILLUMINATION SYSTEM

HEAT STABLE, SALT-TOLERANT MICROBIAL XANTHANASE AND METHOD OF PRODUCING SAME

HEPATOCYTE CELL LINE DERIVED FROM THE EPIBLAST OF PIG BLASTOCYSTS

HERBICIDE TOLERANCE IN MAIZE PLANTS

HYDROPHOBIC EXTRACTED NEEM OIL A NOVEL INSECTICIDE

HYPOALLERGENIC NATURAL RUBBER PRODUCTS FROM PARTHENIUM ARGENTATUM (GRAY) AND OTHER NON-HEVEA BRASILIENSIS SPECIES

IMPACT DETECTION APPARATUS

IMPROVED DIAGNOSIS OF PLANT VIROID AND VIRUS DISEASES BY NUCLEIC ACID HYBRIDIZATION

IN VITRO SCREENING FOR AND SELECTION OF GLYCINE MAX RESISTANT TO PHIALOPHOR A GREGATA

INCREASING STABILITY OF FRUITS, VEGETABLES, OR FUNGI

INSECT MONITORING SYSTEM

INTERACTIONS BETWEEN GENOTYPE AND DIET IN SWINE THAT PREVENT E COLI ASSOCIA ASSOCIATED INTESTINAL DISEASE

INTRODUCTION OF BACTERIA IN OVO

LIVESTOCK WALK-THROUGH FLY TRAP

LOW PHYTIC ACID MUTANTS AND SELECTION THEREOF (3 Licenses)

MATERIALS AND METHODS FOR CONTROL OF PESTS

MEROZOITE PROTEINS FOR USE IN DETECTION OF BABESIA EQUI IN HORSES USING IMMUNOLOGICAL TECHNIQUES

METHOD AND APPARATUS FOR EDGEWISE COMPRESSION TESTING OF FLAT SHEETS

METHOD AND APPARATUS FOR EVALUATING THE DRYING PROPERTIES OF UN-DRIED WOOD

METHOD AND APPARATUS FOR FORMING THREE DIMENSIONAL STRUCTURAL COMPONENTS FROM WOOD FIBER (2 Licenses)

METHOD AND APPARATUS FOR MEASURING OXYGEN CONCENTRATION AND ITS SUBSEQUENT USE IN ESTIMATING NITROGEN FIXATION IN PLANTS

METHOD AND APPARATUS FOR STIMULATING PLANT GROWTH

METHOD AND SYSTEM FOR DETECTING FECAL AND INGESTA CONTAMINATION ON THE CARCASSES OF MEAT ANIMALS DURING AND AFTER SLAUGHTER USING VISIBLE LIGHT FLUORESCENT SPECTROSCOPY

METHOD FOR CONTROLLING YELLOW NUTSEDGE USING PUCCINIA CANALICULATA

METHOD FOR REDUCING FECAL LEAKAGE AND CONTAMINATION DURING MEAT AND POULTRY PROCESSING

METHOD FOR THE DEVELOPMENT OF DELTA LACTONES AND HYDROXY ACIDS FROM UNSATURATED FATTY ACIDS AND THEIR GLYCERIDES

METHOD OF IDENTIFYING THE AVIAN REPELLENT EFFECTS OF A COMPOUND AND METHOD OF REPELLING BIRDS FROM MATERIALS SUSCEPTIBLE TO CONSUMPTION OF BIRDS

METHOD OF INCREASING BIOMASS PLANTS

METHOD OF PREPARING CITRUS FRUIT SECTIONS WITH FRESH FRUIT FLAVOR AND APPEARANCE

METHOD TO PRESELECT THE SEX OF OFFSPRING (3 Licenses)

METHODS AND COMPOSITIONS FOR THE SIMULTANEOUS CONTROL OF ROOT DISEASES CAUSED BY GAEUMANNOMYCES GRAMINIS, RHIZOCTONIA, AND PYTHIUM

METHODS AND COMPOSITIONS FOR TRANSFORMATION OF CEREALS USING CULTURED ORGANOGENIC TISSUE

METHODS FOR DETECTION OF PRION PROTEIN AS AN INDICATION OF TRANSMISSIBLE SPONGIFORM ENCEPHALOPATHIES (2 Licenses)

METHODS FOR PRESERVING FRESH FRUIT

METHODS OF ALTERING SPHINGOLIPID METABOLISM AND DETECTING FUMONISIN INGESTION AND CONTAMINATION

MODIFIED LIVE EDWARDSIELLA ICTALURI AGAINST ENTERIC SEPTICEMIA OF CATFISH (ESC) IN CHANNEL CATFISH

MODIFIED PLANT FIBER ADDITIVE FOR FOOD FORMULATIONS

MONOCLONAL ANTIBODIES AGAINST CHICKEN T-LYMPHOCYTES

MONOCLONAL ANTIBODIES AGAINST POTYVIRUS ASSOCIATED-ANTIGENS, HYBRID CELL LINES PRODUCING THESE ANTIBODIES, AND USE THEREOF

MONOCLONAL ANTIBODIES TO CEFTIOFUR AND ASSAYS FOR THE SAME

MONOCLONAL ANTIBODIES TO HYGROMYCIN B AND THE METHOD OF MAKING THE SAME

MONOCLONAL ANTIBODIES TO POTATO AND TOMATO GLYCOALKALOIDS AND ASSAYS FOR THE SAME

MONOCLONAL ANTIBODIES TO SALINOMYCIN AND METHOD FOR DETECTING THE SAME

MONOCLONAL ANTIBODIES WHICH DISCRIMINATE BETWEEN STRAINS OF CITRUS TRISTEZA VIRUS

MUCOSAL COMPETITIVE EXCUSION FLORA

NATURALLY-OCCURRING ODIFEROUS ANIMAL REPELLENT

NON-SEPARABLE STARCH-OIL COMPOSITIONS

NONDESTRUCTIVE MEASUREMENT OF SOLUBLE SOLIDS IN FRUITS HAVING A RIND OR SKIN

NOVEL COMPOSITIONS AND PROCESS FOR INHIBITING DIGESTION IN BLOOD SUCKING INSECTS

NOVEL GLUCOSE AND CELLOBIOSE TOLERANT BETA-GLUCOSIDASE FROM CANDIDA PELTATA

NOVEL PYRROLIZIDINE ALKALOID

NOVEL THERMOSTABLE ALPHA-L-ARABINOFURANOSIDASE FROM AUREOBASIDIUM PULLULANS

NUCLEOTIDE SEQUENCE OF A COMPLEMENTARY DNA (CDNA) CLONE ENCODING A MAIZE 33KD CYSTEINE PROTEINASE

PASTEURELLA HAEMOLYTICA SUBUNIT VACCINE CONTAINING CAPSULAR

POLYSACCHARIDE AND MURAMYL DIPEPTIDE

PATHEOGEN RESISTANCE IN PLANTS USING CDNA-N/INTRON CONSTRUCTS

PEPTIDES STIMULATING SEX PHEROMONE PRODUCTION AND MELANIZATION IN MOTHS

PESTICIDE COMPOSITION AND METHOD FOR CONTROLLING THE MEDITERRANEAN FRUIT FLY AND THE ORIENTAL FRUIT FLY

PHYTOMINING OF NICKEL FROM SOIL

PIGGYBAC TRANSPOSON-BASED GENETIC TRANSFORMATION SYSTEM FOR INSECTS

PLANT VIRUS RESISTANCE GENE AND METHODS

POULTRY VIRUS AND METHOD

PREENRICHMENT BROTH MEDIUM FOR THE SIMULTANEOUS SAMPLING OF FOODS FOR SALMONELLA AND LISTERIA

PREPARATION OF SECONDARY ETHER FATTY ACIDS AND ESTERS FROM THEIR HYDROXY FATTY ACID EQUIVALENTS

PREVENTION OF FESCUE TOXICOSIS

PROCESS AND APPARATUS FOR DIRECT ULTRASONIC MIXING PRIOR TO ANALYSIS

PROCESS AND APPARATUS TO IMPROVE THE PROPERTIES AND VALUE OF FORAGE CROPS

PROCESS FOR CONVERTING UNSATURATED FATTY ACIDS INTO ESTOLIDES

PRODUCTION OF RECOMBINANT PROTEINS IN INSECT LARVAE

PRODUCTION OF TAXOL OR TAXOL-LIKE COMPOUNDS IN CELL CULTURE

PROPAGATION OF HEMORRHAGIC ENTERITIS VIRUS IN A TURKEY CELL LINE AND VACCINE PRODUCED (4 Licenses)

PVC/TWINE DISPENSER FOR (+)-DISPARLURE

QUICK ASSAY FOR DETECTION OF SALMONELLA

RAPID SINGLE KERNEL GRAIN CHARACTERIZATION SYSTEM

RECOMBINANT ACC SYNTHASE

RECOMBINANT BRUCELLA ABORTUS GENE EXPRESSING IMMUNOGENIC PROTEIN

RECOMBINANT CHITINASE AND USE THEREOF AS A BIOCIDE

RECOMBINANT FOWLPOX VACCINE FOR PROTECTION AGAINST MAREK'S DISEASE

RESOLUTION OF COMPLEX INTEGRATION PATTERNS TO OBTAIN SINGLE COPY TRANSGENES

RESTRICTION ENZYME SCREEN FOR DIFFERENTIATING PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROM VIRUS STRAINS

SACCHAROMYCES TREATMENT TO DIMINISH CAMPYLOBACTER AND SALMONELLA POPULATIONS IN POULTRY

SALMONELLA SELECTIVE PLATING MEDIUM

SARCOCYSTIS NEURONA UNIQUE AMPLIFICATION PRIMER 1470

SCOLYTID REPELLANT

SEQUENCES FOR PRODUCTION OF 2,4-DIACETYLPHLOROGLUCINOL AND METHODS

SEROLOGICAL IDENTIFICATION OF CATTLE, SHEEP OR GOATS INFECTED WITH ANAPLASMA SPECIES

SEROTYPE 2 MAREK'S DISEASE VACCINE (4 Licenses)

SHAKING MECHANISM FOR FRUIT HARVESTING

STABLE GERMICIDAL FILM-FORMING TEAT-DIP SOLUTIONS

STEADFAST (ARS-2620); LOTUS CORNICULATUS L. (FABACEAE); RHIZOMATOUS BIRDSFOOT TREFOIL

STEINERNEMA SP. NEMATODE FOR SUPPRESSION OF HELICOVERPA ZEA AND SPODOPTERA FRUGIPERDA (2 Licenses)

STRAWBERRY CALLED MNUS 248

STRAWBERRY PLANT CALLED MNUS 210

SYNTHESIS OF (ALL-E)-2,7-DIMETHYLOCTA-2,4,6-TRIENE-1,8-DIAL-13C4, A PRECURSOR FOR THE PREPARATION OF STABLE ISOTOPE (13C) OF CAROTENOIDS

SYNTHETIC PHEROMONES FOR THE SPINED SOLDIER BUG, PODISUS MACULIVENTRIS

SYSTEM FOR PRODUCING CORE/WRAP YARN

TECHNIQUES FOR DETECTING PEST CONTAMINATION OF FOODSTUFFS

TEMPERATURE ADAPTABLE TEXTILE FIBERS AND METHOD OF PREPARING SAME (2 Licenses)

TIFBLAIR

TIFEAGLE BERMUDAGRASS

TIFLEAF 3, TIFT 93, AND TIFT 8593 PEARL MILLETS

TRANSGENIC PLANTS EXPRESSING BACTERIAL ATRAZINE DEGRADING GENE ATZA (2 Licenses)

TRANSGENIC THOMPSON SEEDLESS GRAPE PLANTS

TREE ROOTING USING SYNTHETIC AUXINS

TURKEY SEMEN EXTENDER (2 Licenses)

USDA PROBIOTIC FOR CONTROL OF SALMONELLA

USE OF ALUM TO INHIBIT AMMONIA VOLATILIZATION IN POULTRY LITTER

USE OF CLAYS TO REDUCE DISEASE AND INSECT DAMAGE TO PLANTS

USE OF N-METHYL-ASPARTIC ACID FOR ENHANCING GROWTH AND ALTERING BODY COMPOSITION

VACCINES FOR THE PROTECTION OF ANIMALS AGAINST HYPODERMOSIS

VACCINES SYNTHESIZED BY TRANSGENIC PLANTS

VEGETABLE OIL-BASED PRINTING INK

VIRUS RESISTANT MAIZE AND THE PRODUCTION THEREOF

AFLATOXIN RESEARCH

Mr. Skeen: Please update the committee on some of the agency's accomplishments in aflatoxin research this past year.

Response: ARS accomplishments from aflatoxin research this past year include the following:

ARS has previously released four corn germplasms with resistance to aflatoxin. The evaluations carried out under cooperative agreements with Dekalb (now Monsanto) and Pioneer indicated that this germplasm has been successfully used in developing corn hybrids with higher levels of resistance to aflatoxin accumulation than is currently available in hybrids now on the market. These hybrids are in the companies' advanced testing programs and could become the first corn hybrids with aflatoxin resistance on the market. Using molecular mapping techniques, four QTLs (Quantitative Trait Loci) were found to be involved in the inheritance of resistance to aflatoxin accumulation in a resistant-susceptible lines cross. This indicates at least four genes are involved. Information on molecular markers will be used to conduct a marker assisted selection breeding program with evaluation sites at Starkville and Stoneville, MS, and Weslaco, TX. This will permit the transfer of resistance into elite corn inbreds that can be used more efficiently to develop high yielding corn hybrids with greater resistance to aflatoxin. Commercial corn seed companies can also use these markers in their breeding programs to more efficiently develop aflatoxin resistant hybrids. To provide additional sources of resistance, genes from corn and other sources, encoding antifungal proteins effective against *Aspergillus flavus*, have been moved into surrogate crop plants using genetic engineering and are being tested for efficacy. A minor sugar (xylose) which occurs in corn was found to be an effective inhibitor of aflatoxin when the fungus is grown on oil, the main nutrient in corn germ and the site where most aflatoxin is made in field-infected corn. Another sugar (talose) was shown to be similarly effective, demonstrating that it may be possible to use unobjectionable compounds to significantly decrease production of aflatoxin in corn seeds by Aspergillus flavus. In working to prevent aflatoxin in tree nuts ARS scientists discovered the most potent, non-pheromone, natural plant volatile affecting a moth, described to date. This codling moth species is a major pest of the pome fruit and walnut industries, and the discovered compound is as potent as commercial sex-pheromones, now used for mating disruption in the codling moth eradication program. However, this new compound has the added advantage of attracting female moths, whereas the pheromone only attracts male moths. Female moths are of chief concern since they are the ones which lay eggs producing the larvae that damage the crops. This "attracticide" is now being tested in the field impregnated with a pesticide. In this manner, female (and male) moths can be specifically lured to the pesticide without impact on non-target species.

A four-year commercial field test completed in 1999 showed applications of an atoxigenic strain of Aspergillus flavus to cotton caused both long-term and area-wide reductions in the ability of fungal communities to produce aflatoxin. EPA granted ARS a pesticide registration for the use of this native strain to prevent aflatoxin contamination of cottonseed on 20,000 acres in Arizona. ARS modified laboratory techniques to pilot-plant scale in a grower-run facility in Phoenix where atoxigenic strain product is produced for

use in tests to develop area-wide aflatoxin management methodologies based on atoxigenic strain technology.

For peanuts ARS developed a technique for producing an aflatoxin biological control formulation that reduces the cost and improves the practicality of bringing such a product to market. A patent application for this technique was filed with the U.S. Patent and Trademark Office on July 26, 1999, which could stimulate interest in commercialization of this technology. Peanuts treated with competitive, nontoxigenic strains of A. flavus and A. parasiticus had aflatoxin levels reduced by 90% compared with untreated peanuts, demonstrating the efficacy of the biocontrol technology for reducing aflatoxin contamination in peanuts in the field. Also field treatment of peanuts with the biocontrol fungi was shown for the first time to have a carryover effect to peanuts while in storage. Peanuts that were treated in the field and then taken into storage and exposed to conditions favoring the development of aflatoxin contamination showed reductions in crop year 1998 peanuts of 98% and in crop year 1999 of 96%. In a breeding program to develop aflatoxin resistant peanuts ARS screened over 150 peanut breeding lines for resistance to preharvest aflatoxin contamination. Twenty three lines which showed at least a 50% reduction in aflatoxin contamination were identified, and they will be reevaluated in 2000.

Mr. Skeen: By location, please provide the dollars and staff years devoted to aflatoxin research in fiscal years 1999, 2000 and 2001.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Phoenix, AZ	--	--	$250,000	1.0	$250,000	1.0
Albany, CA	$1,788,900	6.7	1,822,800	6.2	1,822,800	6.2
Dawson, GA	745,600	2.9	759,400	3.0	759,400	3.0
Tifton, GA	544,200	1.5	555,800	1.6	555,800	1.6
Peoria, IL	827,300	2.9	842,900	2.8	842,900	2.8
New Orleans, LA	2,832,700	10.9	2,891,000	11.9	2,891,000	11.9
Miss. State, MS	669,100	2.8	683,600	2.8	683,600	2.8
Stoneville, MS	--	--	500,000	1.0	500,000	1.0
Headquarters	861,200	--	871,600	--	871,600	--
TOTAL	8,269,000	27.7	9,177,100	30.3	9,177,100	30.3

AQUACULTURE RESEARCH

Mr. Skeen: Please update the Committee on the research you are doing in connection with aquaculture research, specifically the 1999 accomplishments and plans for future research.

Response: ARS research on aquaculture will be provided for the record.
[The information follows:]

Auburn, AL - Diagnosis and control of diseases and parasites of cultured fish.
Pine Bluff, AR - Aquaculture production and processing technology.
Stuttgart, AR - Research on therapeutics evaluation, health management and culture systems for farm-raised fish.
Albany, CA (Fairbanks, AK Worksite) - Improve use of fish processing wastes in fish diets.
Albany, CA (Hilo, HI) Oceanic Institute - Development of Tropical aquaculture feeds and culture technology (extramural).
Aberdeen, ID - Genetic improvement and nutrition to improve efficiency for rainbow trout.

New Orleans, LA - Improve flavor quality of farm-raised catfish.
Beltsville, MD - Utilization of the national fish parasite collection.
Beltsville, MD (NAL) - Aquaculture Information Program provides the public with information on all aspects of aquaculture.
Oxford, MS - Improve water quality and control problem algae with natural products.
Stoneville, MS - Improve production efficiency, including breeding, genetics, nutrition, health, harvesting, and product quality of catfish.
Wyndmoor, PA (Dover, DE Worksite) - Food safety of farm-raised fish.
Leetown, WV - Cool and cold water aquaculture research.
Headquarters (Mississippi State University/Center for Food Safety and Post-Harvest Technology) - Product quality and safety of processed warm water fish.

The fiscal year 1999 accomplishments in aquaculture by program component are:

Genetic Improvement

Developing genomic library for rainbow trout. ARS collaborators at West Virginia University have obtained DNA samples and production data from a commercial trout population that will be useful for further development of the trout genetic linkage map. DNA markers (microsatellites) from related salmonids have been tested in rainbow trout. A DNA library that is enriched for microsatellites has been made and will be used to efficiently develop additional trout DNA markers. DNA markers associated with genes have also been developed and mapped and they will be useful for comparing mapping information across salmonids and other fin fish. The library will lead to the creation of genetic maps, that will be the basis for rapid improvement of the health and productivity of trout.

Immune system gene cloned. Scientists Catfish Genetics Research Unit and collaborators at Mississippi State University cloned the catfish gene encoding the natural resistance associated macrophage protein (nRAMP). The gene contains significant DNA sequence similarity with nRAMP genes of other species. Expression of the nRAMP gene was increased under stimulation of the immune system with lipopolysaccharide, which suggested nRAMP plays a role in the catfish immune system. When genes that affect the immune response in catfish are identified then genetic selection can be used to improve disease resistance.

Further evaluation of catfish strain USDA103. Previous research has lead to the development of a strain of fish, USDA103 strain, planned for release to commercial producers. Over 1.2 million catfish fry from this strain were produced and stocked into earthen ponds and are being evaluated at three different research units. These fish have been evaluated for multiple traits and are being raised in ponds to produce broodfish for planned germplasm release. USDA103 strain evaluations have demonstrated faster growth, increased feed consumption and early sexual maturation compared to other catfish strains. Survival following exposure to virulent Edwardsiella ictaluri was significantly affected by variation between catfish families, strains, vaccination, and environmental effects. Vaccination of 30-day old catfish resulted in a relative percent survival of 75% over control fish and starvation following exposure to pathogenic bacteria resulted in approximately 100% improvement in survival over control fish. The release of the USDA103 strain provides the industry an improved germplasm that will increase production efficiency. Genetic selection, vaccination, and starvation following exposure to a pathogenic bacteria are processes that can be used to decrease death losses associated with bacterial diseases. However, starvation has a negative effect on growth rate.

Integrated Aquatic Animal Health Management

Copper sulfate shown to have minimal environmental impact. Copper sulfate has been used for many years as a disease therapeutant for cultured food fish but its use has not been approved by the U.S. Food and Drug Administration (FDA). Part of the FDA's requirement for approval of copper sulfate for treating food fish is that copper sulfate must be demonstrated safe for the environment. ARS scientists at Harry K. Dupree National Aquaculture Research Center (HKDNARC), Stuttgart, Arkansas, have submitted documentation demonstrating that copper sulfate has a minimal effect on the environmental when properly used as a disease therapeutant. The FDA will review the submitted data to reach its decision which is critical to gaining FDA approval for use of copper sulfate as an aquaculture disease therapeutant.

Aquavac-ESC available in 2000. The Aquatic Animal Health Research Unit's, Auburn, Alabama, ESC vaccine was licensed to Intervet, Inc., Millsboro, Delaware. Intervet is manufacturing and testing their Aquavac-ESC vaccine in three locations in three states by vaccination of about 100 million fry of ages 7 to 27 days post-hatch. Intervet anticipates that if the trials continue to go well, the vaccine Aquavac-ESC will be available for use in 2000.

Inhibitor of a methylisoborneol (MIB) off-flavor producing blue-green algae. ARS Scientists at the New Orleans, Louisiana, discovered an abundant, naturally-occurring compound and a potent inhibitor of a methylisoborneol-producing blue-green algae isolate from Mississippi catfish ponds, an algal toxin producer thought to cause fish kills in aquaculture ponds, and an algae identified as the primary source of methylisoborneol in potable water sources. These research results suggest this compound could potentially be an important new tool to reduce the impact of problematic algae. Whereas, nitrogen has been identified as being a primary factor stimulating problematic bloom formation, this research is the first to show that a specific form of organic nitrogen may directly inhibit certain problematic algae. Field studies are currently being conducted to determine the effectiveness of the naturally-occurring compound when applied to a catfish pond.

Reproduction and Early Development

Grow-out defined for Arctic charr. Little information is available on growth rate characteristics of Arctic charr when they are grown out at water temperatures of 12-14 C. Scientists at the Fresh Water Institute, Shepherdstown, West Virginia, compared the growth of two strains of Arctic charr. The Labrador strain became sexually mature at a younger age and smaller size than the Nauyuk strain. This work is significant because it increases the knowledge base about grow-out characteristics of charr reared in water temperatures common to the Appalachian region.

Growth, Development, and Nutrition

Floating feeds could solve several problems. Feed intake needs to be regulated and monitored under practical fish and shrimp culture conditions to achieve acceptable growth rates, maintain a quality culture environment and still make a profit. Scientist of the Oceanic Institute, Hilo, Hawaii, demonstrated the technical feasibility of feeding shrimp with floating feeds. The use of floating feeds would greatly improve feed efficiency, reduce wastage, and allow farmers to accurately observe shrimp feed intake. At present under outdoor practical farming conditions accurate measurement of feed intake is not possible because of the normal benthic feeding habits of shrimp and poor visibility of pond water.

Daily feeding more profitable. Current recommendations are to feed catfish every other day during hot weather, but feeding catfish daily translates to higher year-end yields . Scientist at Aquacultural Systems Research Unit, Pine Bluff, Arkansas, compared production of mixed-batches of channel catfish fed either daily, every other day, or every other day when water temperatures were 90 degrees Fahrenheit or warmer. Results indicate that fingerlings in mixed-batch culture grew 70% more when fed daily compared to fingerlings fed every other day. Net production of ponds fed every other day was 23% less than ponds fed daily. Ponds fed every other day had lower overall survivals than ponds fed daily. Revising current recommendations based on this research will result in higher production efficiency which will translate into enhanced farmer profits.

Aquaculture Production Systems

Ozone Increases Catfish Growth. Water quality problems, particularly levels of dissolved oxygen and toxic metabolites, reduce fish growth, increase disease susceptibility and reduce yield in aquaculture. Water from deep wells supplies catfish hatcheries in the Mississippi Delta. But the clarity of this water is often low due to high dissolved organic content. ARS scientists at Stoneville, MS, discovered that injecting ozone, a form of oxygen, into well water dramatically improved clarity and increased water oxygen levels. Growth rate of small catfish (fingerlings)in the ozonated water was 30 percent higher that in tanks with conventual aerated water. This discovery opens the path for increasing catfish fingerling production without expanding the facilities. Studies are continuing to determine if water ozone also has potential as a treatment for disease-causing organisms in hatcheries.

Soybean Meal Cuts Catfish Feed Costs. Catfish farming is highly profitable, but production costs are high. ARS researchers at Auburn, AL found that feed costs can be reduced by substituting heat-treated soybean meal for fish meal. Supplementing the soybean meal with animal and plant oils, amino acids, and minerals allowed replacement of most of the expensive fish meal.

Sustainability and Environmental Compatibility of Aquaculture

Acid Mine Drainage Floc used to bind phosphorus. Loss of soluble phosphorus from land, off-line settling basins, and aquaculture effluent are significant problems. ARS scientist in Kearneysville, West Virginia, and U.S. Geological Survey cooperators determined the phosphorus sorption capacity of acid mine drainage (AMD) floc, a waste by-product from neutralization of AMD. This material consists of chemicals similar to those that are responsible for phosphorus sorption in the soil. The scientist demonstrated that AMD floc has significant phosphorus sequestration capacity and that the phosphorus sequestration capacity varies with the chemical used to neutralize the AMD and the AMD source. This research could provide a use for this waste product (AMD floc) and reduce the loss of phosphorus to the water environment.

Integrated trout and plant production. Aquaculture production facilities generate large amounts of dilute effluent and cleaning it is costly. ARS scientists in Kearneysville, West Virginia, and cooperators from the Freshwater Institute conducted an economic analysis of an aquaponic system for the integrated production of the rainbow trout and plants. It was determined that integrating fish and plant production can be profitable and results in shared cost savings from spreading out operating and capital costs over the two systems. Integrated systems could provide a viable means to generate income concurrent with cleaning dilute effluents.

Quality, Safety, and Variety of Aquaculture Products for Consumers

Copper sulfate reduces off-flavors. Off-flavors in catfish reduce profit by preventing timely marketing. Scientist at the Catfish Genetics Research Unit, Stoneville, Mississippi, and Mississippi State University collaborators determined that weekly applications of low doses of copper sulfate reduced the overall incidence of off-flavor by 80% relative to untreated ponds. Average annual fish harvest was 15% greater in copper-treated ponds because flavor-related harvest delays in untreated ponds exposed fish to a greater risk of loss to diseases. Enterprise budgets showed that average net returns above variable cost were increased by nearly 50% in copper-treated ponds. Variations in net returns was also twice as great for untreated ponds as for treated ponds, indicating increased stability in production and returns when using copper sulfate. Stability in production and costs is a means of reducing risk and is a positive factor farmers can use to better plan their cash flow needs throughout the production season and in the longer term.

ARS plans to continue high priority aquaculture research identified in collaboration with stakeholders, customers, and partners within appropriated funding.

Mr. Skeen: By location, what is the funding and staff for aquaculture research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location	FY 1999 Funds	SYs	FY 2000 Funds	SYs	FY 2001 Funds	SYs
Auburn, AL	$1,913,700	7.0	$2,374,600	9.0	$1,949,600	8
Pine Bluff, AR	531,400	2.0	965,500	2.0	540,500	2
Stuttgart, AR	2,448,600	9.0	2,487,700	9.0	1,985,800	8
Albany, CA (Fairbanks, AK Worksite)	1,086,800	1.0	1,100,000	1.0	1,100,000	1
Ft. Collins,CO	--	--	--	--	187,500	
Hilo, HI Oceanic Institute	1,583,800	--	1,603,000	--	--	
Aberdeen, ID	123,500	1.0	125,800	1.0	--	
New Orleans, LA	745,900	2.4	761,200	3.0	761,200	3
Beltsville, MD (LPSI)	29,600	--	60,500	--	60,500	
Beltsville, MD (NAL)	34,000	--	34,000	--	34,000	
Oxford, MS	277,800	1.0	282,800	1.0	282,800	1
Stoneville, MS Warm Water Aquaculture	4,681,900	8.0	5,019,100	7.0	4,255,500	7

Location	FY 1999 Funds	SYs	FY 2000 Funds	SYs	FY 2001 Funds	SYs
Wyndmoor, PA (Dover, DE, Worksite)	541,900	2.0	552,200	2.0	552,200	2.0
College Station, TX	358,800	--	--	--	--	--
Kearneysville, WV	1,737,600	1.4	--	--	--	--
Leetown, WV	1,235,000	4.0	3,327,100	5.0	2,689,600	5.0
Headquarters	--	--	618,100	--	363,100	--
Total	17,330,300	38.8	19,311,600	40.0	14,762,300	37.0

HOG CHOLERA AND FOOT AND MOUTH DISEASE

Mr. Skeen: Please update the Committee on the research you are doing on hog cholera and foot and mouth disease, including the fiscal years 1999, 2000 and 2001 funding levels, by location.

Response: Both foot and mouth disease and hog cholera (classical swine fever) are foreign animal diseases and therefore all research on these viruses is conducted at the Plum Island Animal Disease Center (PIADC), Orient Point, New York. Foot-and-mouth disease (FMD) remains the most important foreign animal disease threat to the livestock and animal food production industries of the US. FMD has not been detected in the US for over 70 years, but it continues to wreak havoc with our trading partners. FMD has often circumvented costly national and international control programs due to the high virulence, ready transmission, and genetic flexibility of the virus that causes the disease. An introduction of an uncharacteristically virulent form of FMD into Taiwan in 1997 resulted in the total depopulation of the swine population in that country and a economic loss of over $6 billion (US) to that country. Federal law restricts all work on FMD to a USDA laboratory located on an offshore island (Plum Island), where an animal disease research center (PIADC) is operated by the USDA. Over half of the research funds expended at the Center are devoted to FMD. This consists of a total for fiscal year 1999 of $6 million and a total for fiscal years 2000 and 2001 of $5.2 million. Over the last year, important research has been completed in several areas of FMD research. These research projects have included the preliminary genetic characterization of the new variant causing the outbreak in Taiwan, development of a genetically engineered vaccine of the disease, and the development of a diagnostic test in conjunction with a U.S. biotechnology company. Over the next year, research will compare the Taiwan FMDV strain to other Asian viruses (which will be important in identifying the source of the introduction), and continue development of the recombinant DNA derived vaccines. In addition, new knowledge will be developed about FMDV-host cell interactions at the cellular and immunological levels that can be used to develop new methods to control this important disease.

Hog cholera (classical swine fever (CSF)) is a highly contagious viral disease of swine which was eradicated from the United States in 1978. The pig is the only natural host and is the main source of spread of the virus. CSF is one of the biggest foreign animal disease threats to the U.S. swine

industry mainly because the disease in present in the Caribbean and the Americas. The 1997 CSF epidemic in the Netherlands resulted in the depopulation of more than 12 million pigs (2/3 of all pigs) and posed a devastating economic loss to Dutch agriculture. The economic costs were over $5 billion. The economic impact on international trade have not yet been assigned a dollar figure. The slaughter of such a large number of animals, including many uninfected pigs was required to control and eliminate the disease. A control policy based solely on "stamping out" has potentially disastrous economic, environmental and political impacts. Thus, the use of vaccination, followed by quarantine and testing for positive reactors may become an important means to control the spread of the virus and for eradicating the disease.

In fiscal year 1998, ARS Headquarters provided $200,000 from agency Contingency Funds for hog cholera research at the Plum Island Animal Disease Center (PIADC) to study vaccination options for the U.S. in the event of an outbreak. During fiscal years 1999 and 2000, ARS is not conducting research on hog cholera, although our scientists at the PIADC have knowledge of this disease and the capacity to conduct research studies if required. The outbreaks of hog cholera in Europe and in the Dominican Republic have raised the level of concern of the U.S. swine industry and the APHIS.

In fiscal year 1998, commercial hog cholera/classical swine fever vaccines, currently manufactured in Europe, were evaluated for their ability to protect swine from CSF. With all three vaccines, protective immune responses were observed at 21 days post-vaccination for animals challenged with some of the CSF virus strains currently circulating in the Caribbean. These results provide part of the resources that will be needed for emergency response for a CSF outbreak in the U.S.

Given the potential significance of CSF to the U.S. swine industry, ARS is requesting an increase of $1.3 million for research at the PIADC, Orient Point, New York. Research is needed in two general areas to further reduce the threat posed by this disease. More rapid, specific and sensitive diagnostic tests are needed to distinguish CSF virus from other more common pestiviruses and to improve detection of animals infected with less virulent strains of the virus, like those that are currently circulating in the Caribbean and the Americas. Additionally, improved marker CSF vaccines are needed, specifically, live-attenuated virus vaccines incorporating a distinguishing marker. This type of marker vaccine would allow for rapid induction of immunity in vaccinated animals. This is a characteristic of live-virus/marker vaccines, whereby they permit vaccinated animals to be distinguished from naturally infected ones. Having a marker vaccine that would result in rapid onset of immunity is an urgent need for U.S. emergency response.

The funding for Hog Cholera and Foot-and-Mouth Disease by location for fiscal years 1999, 2000, and 2001 will be provided for the record.
[The information follows:]

Hog Cholera	FY 1999	FY 2000	FY 2001
Orient Point, NY	--	--	$1,300,000

Foot-and-Mouth	FY 1999	FY 2000	FY 2001
Orient Point, NY	$5,958,300	$5,208,200	$5,208,200

BIODEGRADABLE PLASTIC

Mr. Skeen: Please update the Committee on the research you are doing in

connection with biodegradable plastic, by location.

Response: Development of totally biodegradable polymer materials based on starch is a major emphasis of research at the National Center for Agricultural Utilization Research (NCAUR) in Peoria, Illinois. Scientists at the NCAUR generate new fundamental knowledge and develop new materials from renewable agricultural resources such as starch and cereal proteins, and other biodegradable polymers using extrusion, molding, and jet-cooking processing technologies. New materials have suitable properties for many disposable, one-use consumer applications. At the Western Regional Research Center (WRRC) in Albany, California, research is focussing on development of biodegradable materials from wheat carbohydrates and proteins. Development of biocomposites from the natural materials pectin, starch and glycerol is one focus of biodegradable research at the Eastern Regional Research Center (ERRC) in Wyndmoor, Pennsylvania. These materials are potentially useful in fabricating biodegradable coatings, packaging materials, and pharmaceutical devices. Another program at Wyndmoor produces biodegradable polymers called polyhydroxyalkanoates (PHA's) by microbial fermentation of commodity fats and oils. ERRC scientists are collaborating on research investigating the unique adhesive and film properties of these PHA's and their chemical modification. Films are also being developed from dairy proteins and from a low cost zein, or corn protein.

Mr. Skeen: What are some of the agency's accomplishments in this field of research?

Response: In cooperation with an Italian University, researchers at NCAUR have developed flexible, water permeable and naturally biodegradable agricultural mulch films prepared from an aqueous mixture of starch, polyvinyl alcohol, lignocellulosics derived from agricultural wastes and/or residues (sugarcane bagasse, wood-flour, and apple and orange pomace), plasticizer (glycerol) and urea as a source of fertilizer nitrogen. An invention disclosure report has been filed with the ARS Patent Committee. Under a CRADA with the United Soybean Board, NCAUR scientists have conducted plant trials with promising results of soy-protein based plywood adhesives at two major plywood manufacturers. The use of soy proteins would replace animal blood proteins, which are coming under increasing scrutiny. Scientists at the WRRC developed methods and formulations for using wheat starch in making starch-based foam panels. A CRADA has been established with a starch manufacturer to further develop the product, and a patent is being prepared on the technology for making starch-based foams as alternatives to plastic foams. ERRC scientists have developed an extrusion process for preparing completely biodegradable pectin/starch/glycerol biocomposites. This process will reduce the cost substantially over previous methods of making these materials and thus make them more competitive with similar materials in the market place. ERRC scientists have agreements with U.S. and international institutions to test the physical properties of biodegradable medium-chain-length PHA polymers in applications as adhesives, films, and fibers. A patent application covers the genetic engineering of microbial strains capable of converting intact fats and oils into these polymers. ERRC scientists have also developed milk protein films with potential application as edible films to protect against moisture loss or in composite food films. They have also economically extracted a corn protein/lipid isolate which can be sprayed on Kraft paper as a grease proofer and water barrier and which can then be enzymatically removed from the paper to allow the paper to be recycled.

Mr. Skeen: By location, what is the funding and staff for biodegradable plastic research for fiscal years 1999, 2000, and 2001?

Response: The dollars and scientist staff years devoted to biodegradable plastic research will be provided for the record.
[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Albany, CA	$372,200	1.7	$558,300	1.7	$558,300	1.7
Peoria, IL	1,648,100	5.2	1,679,100	5.2	1,630,500	5.2
Wyndmoor, PA	1,205,800	6.2	1,528,300	6.2	1,528,300	6.2
Total	3,226,100	13.1	3,765,700	13.1	3,717,100	13.1

BIOTECHNOLOGY RESEARCH AND DEVELOPMENT CORPORATION

Mr. Skeen: Please update the Committee on fiscal year 1999 accomplishments and plans for fiscal year 2000 research underway at the Biotechnology Research and Development Corporation.

Response: During fiscal year 1999, BRDC added two new shareholders to the consortium bringing the total of private sector participants to ten (10). The new shareholders are Baxter Healthcare Corporation and the Monsanto Company. The addition of these two companies adds strength and diversity to BRDC's private sector partners. Baxter represents a potential commercial partner for BRDC's biocompatible materials and self-cleaning polymer compositions while simultaneously providing additional support for BRDC's comprehensive swine research program. Monsanto adds the needed strong interest in plant genetics as well as in swine research with their subsidiary DeKalb Genetics, the United States' largest supplier of swine breeding stock.

In fiscal year 1999 BRDC executed its thirty-fourth commercial license and reached the $2 million mark in total licensing income. BRDC also entered into negotiations with a start-up business to license technology developed at the ARS' NCAUR facility in Peoria, IL and to locate the initial commercialization scale-up facility in the recently renovated pilot plant at NCAUR. This is a first for ARS and BRDC played a key role over the past six years in the development of the technology. The technology will provide a method of controlling a common insect pest of apples, blueberries, cherries and walnuts without repeated spraying of insecticides on the fruits themselves.

BRDC's long term commitment to the development of composite materials based on biodegradable materials derived from commodity agricultural products paid dividends again in fiscal year 1999. BRDC and NCAUR scientists demonstrated the compatibilization of cornstarch and corn derived polylactic acid for making moldable materials. This employed the use of a proprietary biodegradable polyester developed by the Dow Chemical Company. This research will continue through fiscal year 2001. Other research being conducted in fiscal year 2000 includes, but is not limited to, the use of enzymatic oxidation's to convert renewable resources, i.e. carbohydrates and cellulose, to valuable feedstock chemicals, immobilized enzyme technology for carrying out bioconversions in nonphysiological conditions, plant genetic studies targeted to developing plants resistant to emerging plant diseases and development of non-addictive synthetic analogs to plant derived analgesics.

Mr. Skeen: Please update the Committee on the research carried out by the Animal Health Consortium headquartered at Ames, Iowa.

Response: The AHC division of BRDC has increasingly focused its research efforts on swine health and genomics over the past three years. Of the more than $3 million spent directly on research (this does not include more than $300,000 obtaining patent protection) eighty seven percent (87%) has been

spent on swine related problems. Work is now underway to clone pigs using BRDC's proprietary embryonic stem cell technology. The goal is to eventually generate cloned animals that can be used for xenotransplantation and alleviate the extreme shortage of donor organs for organ transplantation. A major program has been undertaken to study the expression of genes in the pig's immune response in an effort to identify the bases for disease resistance and susceptibility. This is coincidental with the genetic evaluation of animals that are apparently resistant to common swine infections. An example of the latter is the E.coli F18+ resistance marker identified, patented and licensed to a BRDC shareholder.

The AHC division of BRDC continues a substantial program in the development of vaccines for major diseases of commodity animals. This work includes the development of new vaccines and a systematic study of the parameters of the underlying mechanisms of disease susceptibility. One of BRDC's immediate goals is to expand the swine genomics program to include tissue and organ systems other than those directly involved in the immune response.

Although swine is the major focus and will continue to be, the AHC division of BRDC is also conducting research in the development of biologicals and vaccines for other major commodity animals including sheep, cattle and poultry. The attempt here is to develop the genetic tools to produce attenuated live vaccines. The tools produced are anticipated to be applicable to entire families of organisms and thus enable the development of vaccines that address, e.g. Pasteurellacea sp., and can be adapted to a variety of species that infect a wide host range.

Mr. Skeen: Please update the table that appears on page 612 of last year's hearing record indicating the funding history for the Corporation.

[The information follows:]

Biotechnology Research and Development Corporation
Calendar Year Funding History

(In millions of dollars)

	1992	1993	1994	1995	1996	1997	1998	1999
Source of Funding:								
Federal (USDA)	$2.54	$2.54	$2.60	$2.60	$2.58	$2.56	$2.54	$2.54
Federal (AARC)	--	--	.06	.16	.23	.10	.10	0
State (Illinois Dept of Agriculture)	.06	.20	.20	.20	.20	.14	0	0
Corp. Participants	1.20	1.23	1.41	1.15	.62	.51	.37	.52
Royalties, interest, licensing fees & other income	.10	.05	.11	.24	.79	.58	.61	.61
Total	3.90	4.02	4.38	4.35	4.42	3.89	3.62	3.67

FRUIT AND NUT RESEARCH

Mr. Skeen: In table format, please update the Committee on the research you are doing in connection with apples, blueberries, peaches, pecans, etc. by location, including brief highlights of 1999 accomplishments.

Response: The current program in fruit and nut research includes research activities on many different fruit and nut crops including apples, pears, oranges, grapefruit, lime, lemon, plum, peach, prune, strawberry, raspberry,

blueberry, grape, pecan, walnut, hazelnut and many minor tropical and subtropical crops. Projects include both pre- and post-harvest investigations for improved product varieties and quality. Projects at 35 locations involve both basic and developmental research in plant breeding and genetics, physiology, entomology, pathology, and engineering technologies. Current research activities by location will be provided for the record.

[The information follows:]

LOCATION	OBJECTIVES	1999 ACCOMPLISHMENTS
Booneville, AR	Develop management practices for soil and water and implement agroforestry techniques on family farms.	Developed models to predict soil phosphorous runoff; demonstrated that liming can be used to reduce soil acidity.
Tucson, AZ	Improve bee pollination of crops and ecologically important plants.	Characterized survival rates of honey bees fed different pollen sources; characterized nest behavior in bees produced from crosses of Africanized and European bees
Albany, CA	(1) Develop improved methods for detection of compounds affecting healthfulness and quality of foods; (2) control of nutritional properties of extruded cereal based foods; (3) detection of aflatoxin contamination in human foods by imaging technologies; (4) image analysis and other physical methods for detection of unwanted matter in fresh and processed food for improved quality. Other projects include: (1) the modification of vegetable oils as raw materials for industrial uses; (2) development of edible coatings to keep lightly processed vegetables fresh; (3) devise innovative processing to develop value-added fruits and vegetables for foreign markets; (4) control aflatoxin in tree nuts using biocontrol procedures; and (5) genetically engineer resistance and reduce aflatoxin in tree nuts and figs by decreasing invasion of Aspergillus flavus caused by insects.	Developed non-invasive pistachio nut sorting system; developed new process for manufacture of reformulated fruit purees which preserve intrinsic product nutritional value.

Davis, CA	Develop control practices for bacterial and viral diseases of fruit and nut trees and grapes, resistant rootstocks or cultivars, and chemical treatments to eliminate pre-plant fumigation with methyl bromide.	Two different graft-transmissible agents associated with grapevine graft disease lesions were identified; determined the casual agent of Phytophthora canker, a new disease of almond.
Fresno, CA	Develop quarantine/post-harvest control strategies to reduce losses by insect pests in the investigation of new fumigants and methodologies to reduce methyl bromide emissions. This includes: (1) research on reducing or eliminating chemical pesticides and developing alternative biological and physical treatments and integrated pest management control procedures. Research is also being done to develop alternatives to methyl bromide in the management of soil pests. In addition, Prunus and Vitis germplasm is hybridized for increased pest resistance, drought and salinity tolerance with improved fruit characteristics. Control post-harvest decay utilizing microbial biocontrol and improve commodity handling with reduced injury to fruit. Determine the feasibility of cropping systems utilizing subsurface drip irrigation to apply alternative fumigants as well as irrigation.	Developed natural salt formulations to control postharvest fungal decay; identified a methyl bromide alternative postharvest treatment for walnut pest control which satisfies export requirements; developed cold treatment practices for insect disinfestation of dried fruits; developed new superior black seedless and white seedless table grape varieties.
Riverside, CA	Determine the fate and transport of alternative fumigants to methyl bromide in field application.	Relationships between fumigant concentration and plant pathogen mortality have been developed.
Salinas, CA	Develop biologically-based or chemical alternatives to methyl bromide as a soil fumigant for control of soilborne pests of strawberry as a component of integrated management strategies for suppression and control of soilborne pests in strawberry and vegetable crops.	Strawberry cultivars were screened for performance attributes in non-methyl bromide treated field plots.

Ft. Collins, CO	Determine the physiological and biochemical factors responsible for loss of seed viability and deterioration in storage and develop improved storage methods.	Results from a 20 year seed viability test suggest that seed vigor is maintained longer in liquid nitrogen then at -18C.
Newark, DE	Develop biological control of selected insect pests: Tarnished Plant Bug, Alfalfa Plant Bug, and Sweetpotato Whitefly (in greenhouses) and quarantine evaluation of predators of Russian Wheat Aphid.	A new species of Lygus parasite was introduced into the eastern U.S. to control the tarnished plant bug.
Winter Haven, FL	Develop alternative chemical and non-chemical treatments for preserving quality and improving convenience of minimally processed fresh fruits and vegetables.	Developed new edible coatings for fruits; characterized flavor profiles in citrus to aid in development of postharvest handling practices.
Montpellier, FR	Discover, collect, and ship to the U.S. new natural enemies to reduce populations of codling moth, gypsy moth, pear thrips, pear psylla, and apple ermine moth.	Potential antagonists to control fruit pests were collected for evaluation by collaborators in the U.S.
Byron, GA	(1) Breed and develop deciduous peach fruit cultivars and rootstocks adapted to the Southeast. (2) Develop control strategies for insect problems of deciduous fruit. (3) Identify and develop improved cultivation and disease management strategies for pecan. (4) Identify factors affecting the nature and occurrence of disease and nematode problems of deciduous fruits in the southeastern U.S. (5) Develop disease and nematode management procedures based on biological control and nonchemical methods for the management of post-harvest diseases of stone fruits. (6) Develop alternative methods of biological control for insect pests of pecan.	Released a new peach cultivar which permits harvest at a more mature stage of fruit development, thus improving fruit quality and minimizing postharvest losses.
Tifton, GA	Determine pesticide residues in food crops in support of petitions to EPA through the IR-4 "Minor Use" project for registration or reregistration of pesticide use.	Cooperative research with state and federal agencies is ongoing to evaluate pesticide residues in fruit to support registration for grower use.

Hilo, HI	Develop novel and more efficient semiochemical based eradication technology for fruit flies.	Developed protocol to permit export of bananas to U.S. without fumigation.
Peoria, IL	Identify biologically active natural products and determine their potential for commercial exploitation as herbicides, fungicides, and plant growth regulators.	Developed new natural product formulation for use as an insect bait in apple orchards.
Urbana, IL	Develop control measures for weeds in vegetables, fruits and specialty crops and determine pesticide residues in harvested products.	Data was collected to speed registration of alternative herbicides for use in blueberry production.
New Orleans, LA	This multifaceted research program includes: (1) investigation on the conversion of commodity by-products (nut shellers, grain millers, oilseed crushers) to value-added adsorbents and the optimization of adsorbent properties for removal of metals and organics; (2) immunological studies on enzymes involved in aflatoxin formation to investigate processes of aflatoxin formation; (3) clone genes governing aflatoxin formation in studies designed to select plants expressing compounds inhibitory to aflatoxin formation; and (4) optimize the flavor and texture of fresh cut fruit products and develop methodologies for predicting food sensory quality to meet consumer demand.	Demonstrated that nut shells may be superior metal adsorbents for use in waste water treatment applications; discovered a family of diverse antifungal proteins in corn which may be used to control aflatoxin in nut crops.

Beltsville, MD	(1) establish and implement area-wide pest management for high priority agricultural pests of fruit and other crops; (2) develop instrumentation to nondestructively assess apple fruit quality; (3) develop methods to utilize gypsum byproducts for use in field soil applications of fruit crops; (4) enhance the development of blueberry cultivars utilizing molecular techniques to manipulate the chilling required for flowering; (5) develop methods to genetically transform raspberry and regenerate plants in tissue culture; (6) develop and introduce new germplasm and cultivars of small fruits, such as blueberry and strawberry, that are pest and disease resistant; (7) develop molecular methods for detection and control of viruses and viroids in fruits; (8) process prohibited foreign germplasm through quarantine and deposit in U.S. repositories; (9) develop molecular methods to detect and identify phytoplasms pathogens in plants; (10) transfer genes and develop tissue culture methods to improve peach, apple and pear; (11) increase quality and shelflife of fruit by controlling ripening and softening; (12) reduce the use of fungicides in control of post-harvest decay; and(13) determine the role of membrane lipid metabolism and composition in fruit ripening, senescence and quality.	Developed a diagnostic test for six viroid pathogens of clonal crops to aid in clearing plant material through quarantine; found that the integrated strategy of heat-treating fruit, followed by calcium infiltration and then treatment with an antagonist may be a useful alternative to controlling postharvest decay with fungicides; genes which may confer cold hardiness in fruits were cloned; molecular markers linked to red stele root rot resistance in strawberry were developed to speed development of resistant cultivars.
Frederick, MD	Identify causal agents of graft and insect transmissible disorders of foreign horticultural germplasm and develop rapid methods of detection of exotic pathogens.	New protocols were developed to rapidly identify nepovirus pathogens of stone fruits.
East Lansing, MI	Develop, evaluate and implement new technologies to reduce post-harvest handling damage and nondestructively measure fruit quality for fresh markets and maintain U.S. competitiveness in international markets.	Continued development of an apple sorting technology based on fruit image analysis.

Poplarville, MS	Develop new and improved muscadine grape and other small fruit cultural practices, management techniques and germplasm for the Gulf States Region to increase yield, minimize production losses and conserve natural resources.	Reported that muscadines and muscadine by-products contain resveratrol, a compound that may be useful in the nutritional and chemopreventative treatment of cardiovascular disease and cancer.
Stoneville, MS	Develop and integrate biological and other non-pesticidal methods for control of insect and mite pests of pecan.	Integrated pest management strategies to control stink bug were investigated and the results transferred to Byron, GA. Pecan research was phased out in 2000 at Stoneville.
Ithaca, NY	Acquire, maintain, characterize and distribute apple, grape, and sour cherry genetic resources from this national collection.	At Geneva, NY 3950 accessions of apple, 1350 accessions of cold-hardy grape, and 72 accessions of tart cherry were maintained during the reporting period.
Wooster, OH	Develop improved spray application technology for crop protection using surfactants to reduce crop damage, reduce cost and energy use as well as pollution of the environment.	Foliar spray deposit measurements showed the limits of pesticide delivery and how to keep more material within the target area.
Lane, OK	Characterize the physiological changes occurring during storage and ripening of small fruits and utilize this information to develop practices leading to increased shelflife.	Characterized phytonutrient constituents in small fruits which may contribute to a healthy diet.
Corvallis, OR	Evaluate genetic variability within raspberry, blueberry, and strawberry and identify traits, individuals and populations valuable to breeding programs.	A new red raspberry for late season market use was released.
Wyndmoor, PA	Develop and utilize pectin by-products from fruit in the production of biodegradable polymers.	Developed an extrusion process for developing pectin/starch/glycerol biocomposite polymers.

Mayaguez, PR	Acquire, preserve, characterize and distribute valuable tropical and subtropical germplasm.	The plantain collection was indexed for presence of virus; determined that viral infection accounted for clonal variability in plantain.
College Station, TX	Characterize genetic diversity of existing pecan and hickory cultivars and develop improved pecan cultivars with disease and pest resistance.	Released a new pecan cultivar with superior nut quality and uniform production.
Weslaco, TX	Develop a systems approach to quarantine security for tropical and subtropical fruits with emphasis on fruit flies.	Developed a modified apple treatment for insect control which reduces treatment time, thus permitting earlier export to Mexico markets.
Prosser, WA	Develop chemical control measures for weeds in fruit crops and determine herbicide residues in crops and soils.	Data was collected to speed registration of alternative herbicides for use in fruit production.
Wenatchee, WA	Determine the factors that influence the development of fireblight disease and develop environmentally sound management practices.	Developed a new improved biocontrol agent for control of fire blight.
Yakima, WA	(1) Develop new control methods for green peach aphid and Colorado Potato Beetle utilizing beneficial agents in biological control; (2) develop areawide control program for codling moth using pheromones sterile insects and other biological control agents; (3) determine the amount persistence and fate of insect control chemicals and their toxic breakdown products; and (4) provide efficacy, phytotoxicity, and yield data residue samples for analyses to support the registration of minor use pesticides.	Completed development of a five-year area-wide pest management program using mating disruption to control coddling moth on apples and pears. The program has been widely adopted by fruit growers.

Beaver, WV	Develop agroforestry systems that incorporate production of high-value specialty products to fill niche markets.	Expanded a prototype multi-species woodland cropping system, designed to produce crops over an eight to thirty year cycle, to include small fruit production. Results from this prototype will determine the productive potential of blueberries and blackberries in a woodland environment.
Kearneysville, WV	(1) Identify and isolate genes affecting fruit development; (2) develop enhanced pear and plum cultivars with disease and pest resistance and improved fruit yield and quality; (3) identify and characterize genes associated with cold hardiness and stress resistance; (4) develop pest management methods to reduce pesticide use in deciduous fruit tree production systems; (5) develop plant-based technologies to treat water and concurrently produce a high-value product; (6) develop principles and mechanisms for improved harvesting of fruits for fresh market; (7) develop improved orchard practices affecting fruiting, fruit development and stress tolerance; (8) develop information on interactions between soilborne pests, root development and plant growth; (9) evaluate cover crop species and organic amendments on soilborne disease organisms and weeds as alternatives to methyl bromide; (10) examine the effects of cultural management techniques on the severity of fireblight in apple; (11) develop fundamental knowledge of the microbial community on fruit surfaces and methods for control of pre- and post-harvest disease and soilborne disease; and (12) develop nondestructive sensors measuring the post-harvest quality of apples and incorporate the sensing techniques into an automatic inspection system for sorting apples based on surface and internal defects.	Released a superior quality new fire blight resistant pear variety; released a transgenic plum resistant to plum pox; developed blackberry management practices which permit machine harvest; a clay-based insect repellent developed at Kearneysville was registered by the Engelhardt Co.

Headquarters	Staffing and operation of national clonal repositories for plant germplasm including fruits.	Funds were obligated to permit efficient operation of clonal repositories.

Mr. Skeen: Please provide a summary of supplemental funding you received from industry representatives in fiscal year 1999 and amounts you anticipate for fiscal years 2000 and 2001 for fruit and nut research.

Response: Supplemental funds received from industry representatives are utilized to establish Trusts and Cooperative Research and Development Agreements in support of ARS base research programs and special projects. In 1999, these supplemental funds totaled $20.2 million. In 1999, of these supplemental funds, $1.9 million were estimated for fruit and nut research. It is anticipated that a similar level of supplemental funding will be received in 2000 and 2001 from industry representatives.

Mr. Skeen: By location, what is the ARS and total funding and staff for this research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location	FY 1999 Funds	FY 1999 Scientists	FY 2000 Funds	FY 2000 Scientists	FY 2001 Funds	FY 2001 Scientists
Booneville, AR	$124,400	0.2	--	--	--	--
Tucson, AZ	91,000	0.4	--	--	--	--
Albany, CA	3,856,900	12.5	4,158,300	13.4	4,218,300	13.4
Davis, CA	1,186,100	3.5	1,506,300	3.5	1,643,800	3.5
Fresno, CA	3,574,400	11.9	3,642,500	11.9	3,642,500	11.9
Riverside, CA	56,500	0.3	254,500	0.9	254,500	0.9
Salinas, CA	482,300	1.8	548,400	1.8	505,900	1.8
Fort Collins, CO	298,800	0.6	329,800	0.5	679,800	0.5
Newark, DE	48,900	0.2	49,900	0.2	49,900	0.2
Winter Haven, FL	62,100	0.3	63,500	0.3	63,500	0.3
Montpellier, FR	200,500	--	248,200	--	248,200	--
Byron, GA	2,980,400	6.0	3,036,200	7.0	3,036,200	7.0
Tifton, GA	100,400	--	101,600	--	101,600	--
Hilo, HI	48,900	0.1	92,300	0.1	49,800	0.1
Peoria, IL	46,800	0.2	73,700	0.3	73,700	0.3
Urbana, IL	2,100	--	2,100	--	2,100	--
New Orleans, LA	920,800	3.4	797,800	3.0	797,800	3.0
Beltsville, MD	4,775,900	15.3	5,493,000	16.7	5,566,200	16.7
Frederick, MD	179,400	0.6	182,800	0.6	182,800	0.6
East Lansing, MI	303,400	1.3	309,500	0.5	--	--

Location	FY 1999 Funds	FY 1999 Scientists	FY 2000 Funds	FY 2000 Scientists	FY 2001 Funds	FY 2001 Scientists
Poplarville, MS	1,350,300	4.0	1,377,400	5.0	1,125,400	5.0
Stoneville, MS	239,000	0.4	--	--	--	--
Ithaca, NY	1,106,400	2.6	1,338,100	3.6	1,475,600	3.6
Wooster, OH	291,000	1.5	297,900	1.5	297,500	1.5
Lane, OK	215,500	0.7	304,300	1.1	304,300	1.1
Corvallis, OR	3,045,600	9.1	3,206,000	8.6	3,025,200	8.6
Wyndmoor, PA	706,200	1.8	619,900	1.8	619,900	1.8
Mayaguez, PR	43,600	0.1	44,500	0.1	44,500	0.1
College Station, TX	579,700	2.0	590,200	2.0	640,200	2.0
Weslaco, TX	195,400	0.7	199,200	0.7	199,200	0.7
Prosser, WA	26,100	--	26,400	--	26,400	--
Wenatchee, WA	1,493,300	6.0	1,526,700	6.0	1,526,700	6.0
Yakima, WA	3,108,000	6.7	1,991,900	5.7	2,079,400	5.7
Beaver, WV	204,000	0.6	208,000	0.7	208,000	0.7
Kearneysville, WV	4,987,900	14.7	5,857,800	18.4	5,857,800	18.4
Headquarters	744,300	--	1,612,300	--	1,328,100	--
Total	37,656,300	109.5	40,091,000	115.9	39,874,800	115.9

ANIMAL HEALTH RESEARCH

Mr. Skeen: In table format, please provide a brief description of the work you are doing in connection with brucellosis, blue tongue, scrapie, and tuberculosis research, by location, including 1999 accomplishments, and funding and staff resources devoted in fiscal years 1999, 2000 and 2001.

Response: The objectives of the National Animal Disease Center (NADC) brucellosis research program at Ames, IA are to: 1) Develop effective strategies to prevent brucellosis in cattle and free-ranging wildlife including the development of killed vaccines and new delivery methods; 2) Develop new serological tests with high specificity for use in post-eradication surveillance; and 3) Define ways in which Brucella persist in infected animals and the risks that these animals pose for the re-emergence of brucellosis in the United States.

During fiscal year 1999, NADC scientists completed studies to support full licensure of RB51 as a vaccine for cattle. They demonstrated safety of RB51 in bison calves and completed collaborative studies demonstrating safety of RB51 in nontarget species (vole, ground squirrel, moose, antelope, bighorn sheep, coyote). Efficacy studies for RB51 were initiated in bison calves (completion date 2001). Studies of the duration of immunity were initiated in cattle (anticipated completion date 2005).

The funding for brucellosis research for fiscal years 1999, 2000, and 2001 will be provided for the record.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Ames, IA	$1,932,500	3.2	$1,969,500	3.2	$2,969,500	4.2

The objective in fiscal year 2000 of blue tongue research, at the Arthropod-Borne Animal Diseases Research Laboratory (ABADRL) at Laramie, WY is focused on developing mapping capability to improve the documentation of the presence and absence of vector populations as a basis for strengthening the bluetongue-free status of the upper Midwest and Northeastern regions. To further our ability to generate type-independent control strategies for bluetongue viruses (BTV) the insect cellular receptors for bluetongue virus are being further delineated. Viral genetic studies are continuing to investigate the potential for virus/vector co-evolution. Differences in the ability of epizootic hemorrhagic disease virus (EHDV) to replicate in target endothelial cells from cattle and deer are helping to determine the risk of this disease to U.S. cattle. The ability of *C. sonorensis* biting midges to be a vector of vesicular stomatitis virus is being determined. Additional information on the incidence of EHDV infection of cattle is being gathered to determine risks from infection with this virus. The role that different viral proteins play in infection of both vertebrate hosts and invertebrate vectors is being examined to provide information for the development of novel strategies to block infection and/or replication by orbiviruses. Potential inhibitors of virus attachment and downstream replication events are being examined in mammalian and insect cell lines. Recently developed insect cell lines are being examined for their ability to support replication of BTV and EHDV to assess vector competence.

In fiscal year 2001, the ABADRL will determine how dissolved salts regulates the distribution of the bluetongue vector *C. sonorensis*. Cellular factors that affect the ability of bluetongue virus to replicate in insect vectors will be determined. Novel control strategies developed from this information will be investigated. Viral genetic studies will allow the development of type-specific diagnostics for many of the known bluetongue and epizootic hemorrhagic disease virus types. The ability of *C. sonorensis* biting midges to be a vector for West Nile Virus (new to the Americas) will be determined. Serotype-specific antibody based diagnostics will be developed. An antigen-capture ELISA, for detection of EHDV in *Culicoides sps.*, will be developed. Quantitative real time nucleic acid amplification assays, that allow determination of the degree and severity of infection, will be developed for BTV and EHDV. Chip-based technologies and other rapid detection systems will be developed that allow rapid detection of viruses in the field. Studies on the role that different viral proteins play in infection of both vertebrate hosts and invertebrate vectors will be continued. *Culicoides* proteins that interact with specific viral proteins will be identified and isolated using molecular biological, immunological and genetic screening procedures. Genetic characterization studies of BTV and EHDV field and laboratory strains will be continued to monitor population changes and determine genetic markers for virus characteristics such as virulence and pathogenicity.

In fiscal year 1999, the Arthropod-Borne Animal Diseases Research Laboratory (ABADRL) determined that biting midges of the *Culicoides variipennis* complex consist of three genetically distinct species, and thus represent genetically stable groups, one species of which, *Culicoides sonorensis*, is the primary vector of bluetongue viruses in the U.S. The ABADRL also demonstrated that the distribution of *C. sonorensis* is correlated with levels of dissolved salts in aquatic habitats where the immature stages develop. This will allow more precise determination of where vector populations occur, thus enhancing the definition of bluetongue-free regions, opening the way for vector control approaches, and enabling geographic

information system mapping to improve prediction of risk for livestock exposure to bluetongue disease. The ABADRL also showed that attachment of bluetongue virus to cells of its obligate insect vector is critical to virus transmission. A comparison of the nucleic acid sequences from the attachment gene of many viruses revealed that this gene is highly conserved and suggests that understanding the attachment process may lead to novel, type-independent control strategies. The ABADRL continued to improve and expand protein- and DNA-based diagnostics for BTV and the related epizootic hemorrhagic disease virus (EHDV). Results from a competitive enzyme-linked immunosorbent assay (c-ELISA) for the detection of antibody to EHDV indicate increased infection of cattle with EHDV that intermingle with white-tailed deer. Genetic sequence analysis of a conserved EHDV gene from North America and the Caribbean isolates has provided insight into evolutionary relationships in this group of viruses. Cell lines were developed from field collected *Culicoides* and evaluated for their ability to support the growth and reproduction of BTV and EHDV.

The funding for blue tongue research for fiscal years 1999, 2000, and 2001 will be provided below for the record.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Wyndmoor, PA	--	--	$219,700	0.5	$219,700	0.5
Laramie, WY	1,990,700	4.3	1,624,300	4.2	1,624,300	4.2
TOTAL	1,990,700	4.3	1,844,000	4.7	1,844,000	4.7

The objective of the NADC Transmissible Spongiform Encephalopathy program (scrapie) at Ames, IA is to characterize the agents that cause scrapie in sheep and chronic wasting disease (CWD) in elk and deer in the US. The program strives to improve existing methods and develop new more sensitive methods for diagnosis of TSEs and to develop new methods for extraction and detection of the prion protein that can be used to detect the prion protein in infected animals.

The primary goal of the Scrapie Research Group at the Animal Diseases Research Unit (ADRU) at Pullman, WA was to discover a practical live animal diagnostic test for sheep scrapie. A secondary goal was to develop genetic testing as an adjunct to scrapie control. The first practical live-animal test (third eyelid test) for scrapie was developed and shown to meet stage 1 of the Office International Des Epizooties (O.I.E.) test validation standards. As components of this test, two monoclonal antibodies were developed. These monoclonal antibodies identify prion proteins in infected sheep, deer, elk, cattle, humans, mink, and domestic cats, and have been licensed to two companies. The data collected from scrapie infected sheep flocks continues to support the value of prion genetics in controlling sheep scrapie. For the U.S. scrapie eradication program to be successful, a detailed understanding of the method(s) of scrapie transmission must be accomplished. ADRU in cooperation with APHIS and State and international diagnostic laboratories will complete third eyelid test development and test validation. Their expectation is that this will lead to international acceptance of the third eyelid test as a valid means to eradicate scrapie. This will greatly improve the export potential and opportunities for export of U.S. sheep. The role of prion genetics in defining the susceptibility of U.S. sheep to infection and progression to disease will provide a clear and detailed understanding of the method(s) of scrapie transmission and persistence

During fiscal year 1999, NADC scientists completed studies that demonstrated that intracerebral injection of the US scrapie agent will induce

a neurologic disease in cattle distinct from BSE (mad cow disease) in the United Kingdom. They demonstrated that cattle fed scrapie-infected brains and rendered materials did not develop any clinical disease or develop any post-mortem histologic lesion in the brain typical of scrapie. Scientists at NADC developed a highly sensitive capillary immunoelectrophoresis (CIE) assay for the detection of prion protein. This highly sensitive assay is being validated as a method to detect scrapie and CWD in blood of infected animals.

The funding for scrapie/chronic wasting disease research for fiscal years 1999, 2000, and 2001 will be provided below for the record.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Ames, IA	$1,204,500	2.6	$1,352,500	3.6	$1,352,500	3.6
Pullman, WA	1,068,200	2.5	1,236,100	2.6	1,386,100	3.1
TOTAL	2,272,700	5.1	2,558,600	6.2	2,738,600	6.7

The overall objectives of the NADC tuberculosis program in Ames, IA are to: 1) Define interactions between *Mycobacterium bovis*, which is the organism that causes bovine tuberculosis, and various hosts including cattle and white-tailed deer; 2) Develop and evaluate improved tests for diagnosis of *M. bovis* infection; 3) Develop improved methods for DNA fingerprinting *M. bovis* isolates; and 4) Develop and evaluate vaccines for control and prevention of *M. bovis* infection.

During fiscal year, 1999 NADC developed a method for experimental infection of cattle and white-tailed deer with *M. bovis* so that the disease produced mimics the disease observed in animals naturally infected with *M. bovis*. NADC scientists determined that *M. bovis* is shed in the nasal and oral secretions of experimentally infected white-tailed deer which suggests that these secretions may be involved in transmission of *M. bovis* between animals. Using DNA fingerprinting of *M. bovis* isolates to demonstrate that deer, carnivores, and cattle in Michigan are infected with similar strains. Lesions were characterized that occur in deer naturally infected with tuberculosis.

The funding for tuberculosis research for fiscal years 1999, 2000, and 2001 will be provided below for the record.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Ames, IA	$1,424,400	2.4	$1,451,700	3.4	$1,451,700	3.4

AVIAN INFLUENZA

Mr. Skeen: Please update the Committee on your research effort and resources devoted to avian influenza in fiscal years 1999 and 2000.

Response: The Southeast Poultry Research laboratory (SEPRL) located in Athens, Georgia is involved in the eradication, control, and prevention of avian influenza, a highly infectious and lethal viral pathogen of poultry. The program assists the U.S. poultry industry and other countries in influenza control. Assisting other countries with information and collaborative research is an effective strategy to prevent highly pathogenic avian influenza from being introduced into the U.S. Research areas include: 1) epidemiology of the virus spread throughout the world by comparing the genetic material of different avian influenza viruses; 2) diagnostic test development; 3) development of vaccines and alternative vaccination

strategies; 4) prediction of when a mildly pathogenic virus can mutate to a highly pathogenic virus; and 5) understanding how the virus causes illness in poultry.

Avian influenza viruses cause two major types of disease in poultry: 1) mild disease with respiratory signs and drops in egg production (mildly pathogenic avian influenza), and 2) very severe disease with high death losses (highly pathogenic avian influenza). The Hong Kong outbreak was the highly pathogenic type of avian influenza virus designated as H5N1. The U.S. has never had an outbreak of highly pathogenic H5N1 avian influenza. In 1983-84, the Northeast U.S. had an outbreak of highly pathogenic H5N2 avian influenza in chickens and turkeys. This outbreak cost the Federal Government $60 million to eradicate and cost the consumer $349 million in increased food costs. In 1994-95, Central Mexico experienced an outbreak of a different highly pathogenic H5N2 avian influenza. Research information and logistic support by USDA assisted the Mexican government in eliminating the highly pathogenic avian influenza. Currently, Italy has an outbreak of highly pathogenic H7N1 avian influenza with 11 million poultry affected as of 2/23/00. SEPRL is providing some research support to the Istituto Zooprofilattico delle Venezie, Padova, Italy in molecular characterization of the virus.

The SEPRL has been an active participant in research solutions to the H5N1 avian influenza, which occurred in Hong Kong in 1997. The H5N1 outbreak began as a problem in chickens and spread to infect at least 18 people. SEPRL has collaborated with the Agriculture and Fisheries Department in Hong Kong, and the Hong Kong Zoo on the agricultural aspects of the disease outbreak. This includes providing expert advice and research collaboration on currently available and new serologic tests to detect the virus and diagnose the disease and delivery of a new vaccine to protect poultry. SEPRL collaborated with the Centers for Disease Control (CDC) in Atlanta, Georgia, on the characterization of isolates of the H5N1 viruses. The CDC conducts, as required by law, all aspects on diagnosis of the H5N1 influenza in humans and handles all human clinical specimens. The SEPRL provided collaborative research support on molecular epidemiology of the viruses and testing the human isolates for ability to infect and cause disease in poultry and other bird species.

The major accomplishments of the avian influenza program in fiscal year 1999 were:

1. Determined the unusual ability of Hong Kong H5N2 avian influenza viruses to cause severe disease and high death losses in a variety of domestic poultry including chickens, turkeys, guinea fowl, Bobwhite quail, Japanese Quail, chukar partridges and in a mammal model species, the mouse. Genetic analysis has suggested a role for the polymerase gene in causing severe disease.

2. Working with collaborators in Hong Kong, a new H5N1 virus was isolated in 1999 from the live bird markets and was shown to share the H5 gene segment with the 1997 outbreak virus, but not the other 7 gene segments. The virus was highly virulent for chickens, but not for mice.

3. Continued surveillance of outbreaks of mildly pathogenic H7N2 avian influenza in commercial poultry operations and the live bird markets in the United States. The first detailed report of the relationships of H7 influenza viruses showed a common link for viruses isolated in the last 4 years. Mice were shown not to be involved in the transmission of influenza virus in the H7 outbreak.

4. Over 100 avian influenza viruses have been isolated from wild migratory waterfowl in Alaska and the North Central U.S. These viruses are being evaluated to determine the molecular epidemiologic relationship to avian influenza viruses circulating in Asia and assess their ability to cause disease in poultry.

The on going research effort on avian influenza for fiscal year 2000 are:

1. Advance our understanding of how the avian influenza viruses from the H5N1 Hong Kong outbreak were capable of replicating and causing disease in humans. This is an important area, as we need to fully understand the risks involved in avian influenza outbreaks in poultry and potential to cross from poultry to humans.

2. Provide research assistance in the current outbreak of highly pathogenic H7N1 avian influenza in Italy via molecular epidemiology and pathogenicity information support.

3. Continue to analyze and assess the risk of H5 and H7 avian influenza viruses circulating in the Live Bird Markets of the Northeastern United States, specifically determine the ability to mutate and cause a catastrophic highly pathogenic avian influenza outbreak.

4. Develop Enzyme-linked Immuno-Assays (ELISA) and competitive ELISA assays as more rapidly tests to identify infections by H5 and H7 subtypes, and to distinguish between birds vaccinated and infected with avian influenza virus.

5. Continue to monitor the evolution of North American and Eurasian avian influenza virus strains in a wild migrating birds surveillance program administered through specific cooperative agreements with University of Alaska-Fairbanks and the University of Georgia, Southeastern Cooperative Wildlife Disease Study. Also a research program has been initiated with Russian scientists to better understand the relationships between the influenza viruses of wild birds and those in domestic poultry in western Asia.

6. Continue vaccine development against highly pathogenic avian influenza. New efforts are underway to develop a single vaccine that will protect against different hemagglutinin subtypes of avian influenza virus and for vaccines to protect against mildly pathogenic avian influenza.

7. Study the immunology of avian influenza infections in poultry, especially in finding new ways to detect and protect U.S. poultry

Resources allocated to avian influenza are committed to the Southeast Poultry Research Laboratory: fiscal year 1999 - $1,058,400; fiscal year 2000 - $1,333,600 (includes a fiscal year 2000 Congressional appropriation, of $255,003 that included $150,000 pass through funds to collaborators at the University of Georgia and University of Alaska).

CITRUS ROOT WEEVIL

Mr. Sheen: Please update the Committee on the progress you have made to help control and eradicate citrus root weevil in fiscal year 1999 and plans for fiscal year 2000. Include in your description the funding and resources used and the laboratories involved.

Response: In August of 1993, a *Diaprepes* Task Force was organized to help coordinate research and action activities to control citrus root weevil. At

the request of the Task Force, ARS facilitated the development of a 5-year strategic and operational research plan between ARS, the University of Florida and the grower industry at a workshop held in Winterhaven, Florida, October 15, 1997. The plan was implemented in 1998 as a unified partnership effort. Its goal has been to develop adoptable and sustainable technologies through basic and applied research on citrus root weevil biology and ecology, sampling and surveillance, host-plant resistance, biological, cultural, and chemical control, and integrated pest management. At the current time, there are no technologies on-line to eradicate this pest. The aim is to contain the pest, minimize production losses, and mitigate the problem with an integrated management system approach. Technologies that have recently been generated and that are being used to some degree include improved detection and monitoring methods with commonly used weevil traps and acoustics, management decision aids, adult weevil management with new chemical insecticides such as Admire, larval management with nematodes, egg parasitoids, egg management with oils, and enhanced horticultural practices involving weed control, fertilizer, irrigation and resistant rootstock.

In 1999, field studies were initiated by ARS to test the use of kaolin clays as a behavioral repellent to the adult citrus root weevil. Kaolin clays were found to be quite repellant to adult weevils. In fiscal year 2000, formulation improvements for the kaolin clays to obtain better coverage on the citrus tree will be undertaken. Field trials were continued in 1999 to evaluate existing varieties of citrus rootstock for resistance in high citrus root weevil population areas as a 5-year study. Also, ARS has recently discovered a new root stock of citrus that is totally resistant to the larvae of citrus root weevil. Cultural explants of this new rootstock will be tested in the greenhouse and field in fiscal year 2000. ARS began isolating and screening strains of *Bacillus thuringiensis* toxic to the larvae of the weevil in 1999. At least two strains have been found to be effective. This work will be continued in fiscal year 2000 in collaboration with Abbott Laboratories, Chicago, Illinois. Lastly, in 1999 the ARS completed its studies in the laboratory and greenhouse on a larval digestive inhibitory compound that can be applied to the soil where it is taken up by the root system of citrus. Field trials are planned for fiscal year 2000. ARS has initiated a Cooperative Research and Development Agreement with Morris Enterprises, Miami, Florida, for this latter work.

The U.S. Horticultural Research Laboratory, which is now located in the new facilities at Ft. Pierce, Florida, is currently undertaking the research on citrus root weevil. The funding for citrus root weevil research for fiscal year 1999 was $449,000 with 1.7 scientists; and the funding for fiscal year 2000 is $481,500 with 1.7 scientists.

CITRUS TRISTEZA VIRUS

Mr. Skeen: By location, what is the funding and staffing for the tristeza virus research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Fresno, CA	$458,000	1.1	$466,700	1.1	$466,700	1.1
Ft. Pierce, FL	1,473,400	3.3	1,498,100	4.1	1,498,100	4.1
Beltsville, MD	193,500	0.1	224,600	0.1	224,600	0.1
Frederick, MD	119,600	0.4	121,900	0.4	121,900	0.4
Total	$2,244,500	4.9	$2,311,300	5.7	$2,311,300	5.7

Mr. Skeen: What 1999 accomplishments are you able to report?

Response: The following research accomplishments are reported for 1999:

Prior to early 1999, the replication of the infectious clone of the CTV isolate T36 was limited to protoplasts. The infection of whole citrus plants was not demonstrated until mid-1999 when the infectivity of this clone was finally demonstrated in whole plants. The availability of this clone will permit scientists to identify the function of virus genes and so provide clues as to new methods of control.

Genotyping of over 400 CTV isolates from around the world was completed. This led to a better understanding of the diversity of CTV. isolates in relation to host symptoms. Understanding the virus diversity is vital for making sure that potential control strategies are effective against all important virus strains.

Long-term biological characterization of CTV/host interactions was completed. This provides a clearer understanding of symptom type and host susceptibility associated with C.V. isolate type.

ARS scientists determined the complete genomic sequence of a fourth CTV isolate-T30, the type isolate for the Florida mild isolate group. Also, they are in the process of constructing an infectious clone for this isolate for possible use as a blocking agent to prevent infection of more damaging isolates.

A mathematical model has been developed that allows investigators to determine whether spread of CTV occurs by insect vector movement within groves or from outside sources. This information will be helpful for developing controls.

ARS scientists have determined that the brown citrus aphid is capable of CTV spread/dissemination over distances of 1-2 kilometers from single migrations.

In research to describe the biological and genetic diversity of CTV in California, improved molecular techniques for strain differentiation were developed and used to identify the strains found. Each strain was shown to be a mixture of different genotypes. As in Florida, such information is essential for determining the effectiveness of control methods.

In California, six different aphid species were found on citrus, but only one, the cotton aphid, was present in high numbers and was able to transmit CTV.

GERMPLASM - PLANT AND ANIMAL

Mr. Skeen: By location, what is the funding and staff for germplasm facilities for fiscal years 1999, 2000, and 2001?

the

[The information follows:]

Location	FY 1999 Funds	FY 1999 SYs	FY 2000 Funds	FY 2000 SYs	FY 2001 Funds	FY 2001 SYs
Phoenix, AZ	--	--	--	--	$320,000	1.0
Albany, CA	--	--	$254,300	1.0	254,300	1.0
Davis, CA	$611,500	1.0	639,000	1.0	989,000	2.0
Fresno/ Parlier,CA	460,200	1.0	469,000	1.0	469,000	1.0
Riverside, CA	426,500	1.0	434,700	1.0	784,700	2.0
Ft. Collins, CO	3,154,600	5.9	3,466,100	7.0	3,816,100	8.0
Washington, DC	361,600	1.0	435,900	1.0	755,900	2.0
Miami, FL	954,800	1.0	1,397,600	2.0	972,600	2.0
Griffin, GA	1,476,200	4.0	1,503,200	4.0	1,853,200	5.0
Hilo, HI	488,800	1.0	923,400	1.0	498,400	1.0
Ames, IA	1,617,100	4.2	1,844,500	4.2	2,194,500	4.2
Aberdeen, ID	828,900	1.0	841,400	1.0	1,161,400	2.0
Urbana, IL	536,300	1.5	597,400	1.5	947,400	2.5
Beltsville, MD	3,504,500	9.2	3,836,800	9.2	4,086,800	10.2
Columbia, MO	--	--	248,300	1.0	248,300	1.0
Stoneville, MS	308,600	0.7	314,600	0.7	314,600	0.7
Oxford, MS	453,400	--	659,600	--	283,900	--
Fargo, ND	395,700	1.5	413,000	1.5	403,500	1.5
Ithaca, NY	1,233,800	3.8	1,505,100	4.8	1,855,100	5.8
Corvallis, OR	830,800	2.0	863,400	2.0	1,185,400	3.0
Mayaguez, PR	1,145,700	1.9	1,167,500	1.9	1,167,600	1.9
Charleston, SC	--	--	--	--	320,000	1.0
College Stn,TX	329,600	0.8	488,900	0.8	1,088,900	2.8
Pullman, WA	2,382,900	7.9	2,676,800	8.9	2,376,800	9.9
Madison, WI	321,600	2.2	361,700	2.2	681,700	2.2
Headquarters	832,400	--	1,399,200	--	889,200	--
Total	22,655,500	52.6	26,741,400	58.7	29,918,200	73.7

The funding and staffing for Animal Germplasm by location for fiscal year 1999, 2000, and 2001 will be provided for the record.

[The information follows:]

Location	FY 1999 Funds	FY 1999 SYs	FY 2000 Funds	FY 2000 SYs	FY 2001 Funds	FY 2001 SYs
Ft. Collins, CO	--	--	$ 328,200	1.0	$1,328,200	4.0
Brooksville, FL	$721,900	2.1	623,700	2.0	623,700	2.0
Dubois, ID	970,700	1.9	985,500	1.9	985,500	1.9
Beltsville, MD	3,146,800	8.5	3,216,800	8.3	3,216,800	8.3
Miles City, MT	918,200	2.9	936,200	2.8	936,200	2.8
Clay Ctr, NE	1,866,300	6.6	1,899,100	6.6	1,899,100	6.6
Headquarters	321,800	--	--	--	--	--
Total	7,945,700	22.0	7,989,500	22.6	8,989,500	25.6

Mr. Skeen: For the record, please list the germplasm collections that are maintained by ARS.

Response: The information on location-specific plant and animal germplasm collections maintained by ARS in cooperation with the State and private sector will be provided for the record.

[The information follows]:

Palmer, AK	crop germplasm adapted to high latitudes, native Arctic germplasm.
Davis, CA	almond, fig, grape, kiwi, mulberry, olive, persimmon, pistachio, pomegranate, stone fruit, walnut, and tomato genetic stocks.
Riverside, CA	citrus and related genera, and dates.

Parlier, CA	arid land regeneration site.
Salinas, CA	lettuce genetic stocks.
Fort Collins, CO	base seed collection of major economic crops, base collection of apple bud wood.
Washington, D.C.	woody landscape genera.
Miami, FL	Annona, avocado, mango, Passiflora, sugarcane, Tripsacum, tropical and subtropical ornamental and medicinal plants.
Griffin, GA	cowpea, watermelon, peanut, capsicum pepper, sorghum, warm season forage and turf grasses, tropical and subtropical legumes, annual clovers, mung bean, sesame, okra, eggplant, tropical squash, and sweet potato.
Tifton, GA	pearl millet.
Hilo, HI	acerola cherry, atemoya, breadfruit, carambola, guava, litchi, lychee, macadamia, papaya, passion-fruit, peach palm, pili nut, pineapple, and rambutan.
Ames, IA	maize, melon, cucumber, carrots, spinach, amaranths, sweet clovers, temperate zone millets, oilseed brassicas, sunflower, cuphea, ornamentals, mints, umbels, flax, and soybean genetic stocks.
Aberdeen, ID	barley, barley genetic stocks, oat, rice, rye, triticale, and wheat and its wild relatives.
Urbana, IL	maize genetic stocks and soybean and its wild annual and perennial relatives.
Columbia, MO	triticale and wheat genetic stocks.
Oxford, NC	tobacco.
Fargo, ND	durum wheat genetic stocks.
Ithaca, NY	apple, vegetable brassicas, onion, buckwheat, radish, celery, sour cherry, hardy grape, squash, and tomato.
Corvallis, OR	blackberry, blueberry, cranberry, currant, filbert, gooseberry, hop, mint, pear, raspberry, and strawberry.
Mayagüez, PR	bamboo, banana, plantain, sapotaceous tree fruit, tropical ornamentals, sorghum, tropical quarantine site.
College Station, TX	cotton and cotton genetic stocks, sorghum genetic stocks, chestnut, hickory, and pecan.
Logan, UT	temperate zone range grasses, especially annual and perennial Triticeae.
Pullman, WA	alfalfa, bean, chickpea, vicias, lupines, beets, lettuce, cool season grasses, lentil, onion, pea and pea genetic stocks, clovers and other forage legumes, and safflower.
Madison, WI	potato

ARS has unique farm animal germplasm collections that are maintained as part of the research programs at Beltsville, MD; Brooksville, FL; and Clay Center, NE. Germplasm from the ARS collections are sometimes used for cooperative research with other U.S. research organizations. However, the collections do not serve as a general resource for others outside of ARS.

Mr. Skeen: For the record, please list major germplasm collections in the world and their locations.

Response: A number of nations maintain large and diverse major collections, including Australia, Brazil, Bulgaria, Canada, China, Colombia, the Czech Republic, Ethiopia, France, Germany, Hungary, India, Israel, Italy, Japan, Kenya, Republic of Korea, Mexico, the Netherlands, New Zealand, the Nordic countries, Peru, the Philippines, Poland, Romania, Russia, South Africa, Spain, Turkey, Ukraine, the United Kingdom, Yugoslavia, and Zimbabwe.

Large crop-specific collections are also held at international agricultural research centers (IARCs) of the Consultative Group on International Agricultural Research (CGIAR) in developing countries. Major crop-specific

germplasm collections at IARCs and their locations will be provided for the record.

[The information follows:]

Crop	Location and Organization
Banana	Montpellier, France--International Network for the Improvement of Bananas and Plantains.
Barley	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Bean	Cali, Colombia--International Center for Tropical Agriculture.
Cassava	Cali, Colombia--International Center for Tropical Agriculture and Ibadan, Nigeria--International Institute for Tropical Agriculture.
Chickpea	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics, and Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Cowpea	Ibadan, Nigeria--International Institute for Tropical Agriculture.
Fava bean	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Lentil	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Maize (Corn)	El Bajan, Mexico--International Center for Maize and Wheat Improvement.
Peanut	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Pearl Millet	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Pigeon pea	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Potato	Lima, Peru--International Potato Center.
Rice	Los Baños, Philippines--International Rice Research Institute, and Bouake, Cote d' Ivoire--West Africa Rice Development Association.
Sorghum	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Sweet potato	Lima, Peru--International Potato Center.
Wheat and Triticale	El Bajan, Mexico--International Center for Maize and Wheat Improvement, and Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Yam	Ibadan, Nigeria--International Institute for Tropical Agriculture.

The Food and Agricultural Organization (FAO) is in the early stages of developing a global strategy for the conservation and use of animal germplasm. Several countries have developed "Gene Bank" repositories to conserve the germplasm from animals that are most important to the production of food from animals. At present, there are no major animal germplasm collections.

GRAPE PHYLLOXERA

Mr. Skeen: From your response to questions for the record last year, we understand that the ARS research in connection with grape phylloxera will involve long-term observations and that results may not be known for another 5-7 years. Please provide a table showing by location the funding and staffing devoted to this research since 1995.

[The information follows:]

Location	FY 1995	SYs	FY 1996	SYs	FY 1997	SYs
Davis, CA	$57,600	--	$58,100	--	$57,600	--
Fresno, CA	191,600	0.5	188,600	0.5	186,900	0.5
Total:	$249,200	0.5	$246,700	0.5	$244,500	0.5

Location	FY 1998	SYs	FY 1999	SYs	FY 2000	SYs
Davis, CA	$57,200	--	$56,500	--	$57,500	--
Fresno, CA	185,800	0.5	183,200	0.5	186,600	0.5
Total:	$243,000	0.5	$239,700	0.5	$244,100	0.5

Location	FY 2001	SYs
Davis, CA	$57,500	--
Fresno, CA	186,600	0.5
Total:	$244,100	0.5

Mr. Skeen: By location, what is the funding for grape phylloxera research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location	FY 1999	SYs	FY 2000	SYs	FY 2001	SYs
Davis, CA	$56,500	--	$57,500	--	$57,500	--
Fresno, CA	183,200	0.5	186,600	0.5	186,600	0.5
Total:	$239,700	0.5	$244,100	0.5	$244,100	0.5

GRAPE VIROLOGY RESEARCH

Mr.Skeen: Please update the Committee on the work you are doing in connection with grape virology research, by location.

Response: ARS conducts grape virology research at Davis, California. The research involves identifying the causal agents, describing disease spread, and devising control methods for viruses and graft-transmissible pathogens affecting grapevines. This research effort also includes developing specific assays for the rapid detection and identification of the pathogens. Sensitivities of various commercial grape rootstock to viruses and graft-transmitted pathogens are being investigated.

Mr. Skeen: What 1999 accomplishments are you able to report?

Response: The following are research accomplishments in grape virology for 1999. Three strains of the virus associated with Rupestris stem-pitting were identified by newly-developed molecular methods. Grapevine scion/rootstock incompatibility has been associated with two different graft-transmissible agents. Serological methods to improve the reliability and sensitivity of grape leafroll-associated viruses were developed.

Mr. Skeen: By location, what is the funding and staff for grape virology research for fiscal years 1999, 2000, and 2001?

Response: Grape virology research is being done at the Davis, California location. For fiscal year 1999, the funding was $204,800 with one scientist; for fiscal year 2000 the funding is $208,400 with one scientist; and for fiscal year 2001 the proposed funding is $208,400 with one scientist.

GRASSHOPPER AND MORMON CRICKET

Mr. Skeen: Please update the Committee on the research you are doing in connection with research on grasshoppers and Mormon crickets.

Response: The ARS Northern Plains Agricultural Research Laboratory (NPARL) in Sidney, Montana, conducts research on grasshopper and Mormon cricket control which focuses on environmentally compatible, economical, and publicly acceptable control technology. More specifically, the research being conducted at Sidney includes the use of biological control (especially with microbial agents), reduced pesticide use through baits in place of sprays, and grazing systems research. Additionally, ARS scientists working on grasshoppers and Mormon crickets have greatly increased the knowledge of general biology and population dynamics of these pests culminating in the development of "Hopper," an expert management advice system for ranchers. The overall ARS grasshopper and Mormon cricket research program was highly coordinated with the 5-year interagency Grasshopper Integrated Pest Management Project begun in 1987 and managed by the Animal and Plant Health Inspection Service (APHIS). A technology transfer plan was developed for the Grasshopper Integrated Pest Management Project following the completion of the 5-year Grasshopper Integrated Pest Management Project and was transferred to the states. Technology developed by ARS is an integral part of the program, which includes the Hopper decision support system, baits, and microbial biocontrol agents. The laboratory is continuing work to generate vital information needed on grasshopper ecology, and to develop computer-based models on grasshopper phenology and population dynamics to predict grasshopper growth rates, population trends and economic thresholds. This information is being used to implement a more sustainable grasshopper management system that incorporates biological and cultural control practices. The Systematic Entomology Laboratory at Beltsville, Maryland, provides taxonomic and identification support for grasshopper scientists and in support of APHIS action programs. Also, as the result of a $750,000 Congressional appropriation in fiscal year 1999, ARS at NPARL, Sidney, Montana, recruited two additional scientists to determine the ecology and to develop and evaluate effective biologically-based control agents and attracticide baits for use in grasshopper IPM systems in the Delta Junction region of Alaska in cooperation with the University of Alaska. One scientist was assigned to Sidney, Montana, and the other was located on the campus of the University of Alaska at Fairbanks, as agreed upon between ARS and the University of Alaska at a planning meeting held on February 25-26, 1999, in Fairbanks, Alaska.

Mr. Skeen: By location, what is the funding for grasshopper and Mormon cricket research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
Beltsville, MD	$0	$70,000	$70,000
Sidney, MT	1,433,500	1,458,200	1,458,200
Total:	1,433,500	1,528,200	1,528,200

INTEGRATED PEST MANAGEMENT

Mr. Skeen: Where are the current Integrated Pest Management research projects? What funding is provided for each?

Response: The location and funding for the current Integrated and Areawide Pest Management research projects for fiscal year 2000 will be provided for the record.

[The information follows:]

Location	FY 2000 Funds
Davis, CA	$ 42,500
Fresno, CA	1,010,100
Salinas, CA	589,200
Shafter, CA	231,400
Gainesville, FL	1,291,900
Ft. Lauderdale, FL	1,443,600
Ft. Pierce, FL	852,800
Miami, FL	1,490,300
Byron, GA	199,600
Tifton, GA	574,800
Ames, IA	187,700
Peoria, IL	489,500
West Lafayette, IN	86,400
Manhattan, KS	424,400
New Orleans, LA	88,100
Beltsville, MD	5,926,100
Columbia, MO	90,100
Morris, MN	228,100
Stoneville, MS	2,096,400
Sidney, MT	477,300
Raleigh, NC	171,600
Lincoln, NE	266,300
Ithaca, NY	176,600
Stillwater, OK	198,600
Burns, OR	250,000
Charleston, SC	536,000
Brookings, SD	1,351,100
College Station, TX	856,800
Kerrville, TX	442,700
Weslaco, TX	922,000
Logan, UT	250,000
Prosser, WA	178,400
Pullman, WA	227,000
Yakima, WA	1,570,500
Kearneysville, WV	261,200
Washington, DC	255,100
TOTAL	$25,734,200

Mr. Skeen: Describe each project and the anticipated outcome.

Response: In support of the Department's Integrated Pest Management (IPM) Initiative and other IPM needs, ARS currently conducts IPM research at 36 locations with more than 75 projects that are focused on developing environmentally-friendly pest control technologies. These projects emphasize classical and augmentation biological control, host-plant resistance, behavior modifying chemicals (e.g., pheromone mating disruptors and attracticides), sterile insect release techniques, resistance management, cultural practices, improved pesticide application technologies, and other related pest control tactics. Target pests include a multitude of insects, mites and ticks, plant pathogens and nematodes, and weeds.

A prominent focal point of the agency's IPM program is five areawide IPM pest management projects, which have been developed in partnership with other

Federal and State institutions and the private sector. These multistate 5-year projects are managed out of Yakima, Washington; Brookings, South Dakota; Manhattan, Kansas; Sidney, Montana; and Hilo, Hawaii, and are funded at $5.0 million.

The areawide pest management project using mating disruption for codling moth on tree fruits in the Pacific Northwest was fully implemented in fiscal year 1995, followed by full implementation in fiscal year 1997 of another areawide project using an adult attracticide against the corn rootworm in the Midwestern United States. As an outcome of the areawide IPM codling moth management project, mating disruption technology is being used widely in the apple and pear growing areas of the western U.S. There were a total of over 75,000 acres using the technology throughout Washington, Oregon, and California in 1999. A result of the diminished use of hard pesticides has been a resurgence in the natural enemy populations that have exerted almost complete control of secondary pests. This has further reduced the costs of insect control on apples and pears in this three State area. Although this project ended in fiscal year 1999, ARS has provided some transition funds for fiscal year 2000 to complete the project. The corn rootworm areawide pest management project is carried out in Kansas, Indiana, Illinois, Iowa, Texas, and South Dakota. Corn rootworm populations can be reduced by 85 to 95 percent with less than 10 percent of the chemicals used in current corn rootworm control regimes by using adult attracticide baits developed by ARS, and now marketed by industry. This technology could ultimately become the treatment of choice on the 20 million acres of U.S. cropland currently treated with corn rootworm insecticide, in addition to transgenic corn. This should result in up to a 90% reduction in the amount of soil insecticide applied to U.S. corn grown in the Midwest U.S.

Two other areawide IPM projects were initiated by ARS in fiscal year 1997. One project is directed at insects of stored grain in Kansas and Oklahoma using early aeration to cool grain to reduce insect and mold population growth, thus eliminating the need for phosphine gas and chemical insecticides. The other project is directed at the leafy spurge weed in Montana, North and South Dakota, and Wyoming, using a natural insect predator, grazing systems, decision aid, and revegetation, thus decreasing substantially the use of herbicides. In fiscal year 2000, another areawide project was initiated in the Hawaiian Islands for management of fruit flies using male annihilation, baits, biological control and sterile fruit flies.

Other projects that contribute to the overall IPM program include a community-based field trial study for control of the deer tick and lyme disease in the Northeastern United States, the management of cotton plant bugs in post boll weevil eradication zones, and areawide pest management of silverleaf whitefly across the southern tier of the United States.

The remaining projects, funded at $20.73 million, allow our scientists to work at developing and incorporating component IPM technologies. The scientists are involved with State, regional and local IPM teams in a variety of action-oriented smaller scale implementation and pilot-test projects that demonstrate biologically-based pest control in on-farm situations. The anticipated outcome of these projects will be the adoption of the component technologies by the end-users into IPM and sustainable agriculture systems with a concomitant reduction in chemical pesticide use and increased worker and food safety. Most of these projects are using alternative technologies that will substitute for at-risk chemical pesticides and which could be lost as a result of the Food Quality Protection Act.

HUMAN NUTRITION

Mr. Skeen: Describe the proposed $17.3 million increase requested for human nutrition research in succinct and compelling reasons.

Response: Plans to continue research on what is a healthy body weight for an individual, is critical in a time when obesity is increasing in the United States, especially in children. Although great emphasis has been placed on management of obese individuals and strategies for weight reduction, relatively little is known about health risks associated with mild to moderate increases in weight or the risk; whether specific micronutrient needs increase when obese people lose weight and body fat needs to be determined. ARS has the only direct calorimeters in this country for studying energy expenditure in human subjects of all ages. Research needs to be directed at determination of the true energy expenditures of children, pregnant women, adults, and the elderly with different genetic makeup and patterns of physical activity. Plans to examine the role of bone growth and development, which is important in understanding ways to prevent osteoporosis. Osteoporosis is a loss of bone mass that affects primarily, but not exclusively, postmenopausal women. It leads to debilitating bone fractures. The estimated annual costs of this disease is over $10 billion for care alone. Research will be conducted to identify the nutritional, biochemical, and hormonal regulators of skeletal mineralization during infancy, childhood and adolescence and how they relate to subsequent development of osteoporosis. Special emphasis will be placed on examining the interplay between physical activity and dietary factors. Plans to develop biomarkers of nutritional status, which is important as currently there are insufficient methods to assess micronutrient status. Nutritionally-related diseases typically develop over a period of many years. Often disease symptoms develop without any prior evidence of the underlying disease, yet very little is known about disease risk prior to that point. In order to fully evaluate the role of diet in maintaining health, meaningful measurements of biochemical and physiological function that are related to the nutritional status of an individual and which are indicative of true long term risk for disease, such as cancer and heart disease, need to be developed. The availability of such biomarkers will be of great benefit to understanding how diet and particular nutrients affect disease risk long before the development of any deficiency symptoms. Plans to gain a better understanding of cognition and brain function, which is critical in the development of young children and how well they perform in school. There is growing evidence to suggest that what is consumed can affect the development of the central nervous system and have an impact on how well people learn, how they function mentally, and how the function of the brain deteriorates in many people as they age. However, it is still unclear how the process occurs and what the key steps are in growth, development, and aging that are affected by diet and which might be delayed or prevented by nutritional manipulation. Research will be directed at determination of the environmental, dietary, physiological, and psychological stressors on nutrient requirements for robust mental function. Special emphasis will be placed on defining the key developmental periods for nutritional imprinting that affect the function of the brain later in life, and how diet affects neural development at conception through gestation. Plans to study diet and immune function, in which it has been shown that as one ages, the immune system may become more affected by dietary changes. Infectious diseases are a major cause of mortality and morbidity in all segments of the population. An understanding of how diet affects the immune system is in its infancy, but recent research results from ARS scientists have pointed out for the first time that the nutritional status of a host can affect the disease causing potential of a human pathogen virus. Such results may explain why some

infections are benign in certain populations, but cause mortality in others. Additional research will be conducted to determine the effects of diet on the immune system to determine if other infectious agents can also alter their pathogenicity in response to the diet of the host. The mechanism by which diet alters the immune system will be investigated. Plans to continue examining the role of nutrition throughout the life cycle, as studies indicate that an individual's nutritional needs change at various stages in life. Childhood development is known to impose the greatest need for nutrients within the life span. However, an understanding of what nutrients are required, their levels in the diet, and at what point in the development process they are critical is incomplete. Similarly, an understanding of the changing need for nutrients that occurs as individuals age is incomplete. Studies will be conducted to determine the relationship between diet and bone and skeletal growth; cognitive and neurological development; and the factors that lead to obesity in children. Nutritional requirements that are needed to delay the onset of diseases associated with aging, such as cardiovascular disease, cancer, Alzheimer's disease, macular degeneration, and osteoporosis will be researched. Plans to update the National Nutrient Databank, which is one of the most widely used databases for use by health professionals, school lunch and breakfast programs, researchers, etc., needs to be constantly updated to reflect new food items that are constantly changing in American society. All epidemiological examinations of the health effects of diet are dependent on the quality of the data. Nutrition scientists, health educators, and medical practitioners require an accurate database of the nutrient content of foods in order to understand which food choices result in a healthy diet. In addition, having an accurate database is essential for making dietary recommendations since it is necessary to know with certainty which nutrients are contained in particular foods. Despite its position as the preeminent nutrient database, many food items are not included due to the rapid changes in the food supply; in some cases the data are as much as 30 years out of date. Plans to enhance dietary survey methodology, which is critical in that this information is used in nutrition policy, i.e. Dietary Guidelines, and used for nutrition education programs, i.e., Food Guide Pyramid; and plans for development of food consumption methods, for which data generated is used by the National Nutrient Databank and others. The maintenance of an accurate nutrient database of food composition is dependent on the availability of accurate and robust methods of analysis for foods. ARS maintains the only laboratory whose mission is to develop new and improved methods of analyses. The data obtained will be maintained in the National Nutrient Database. Having this information available will enable nutrition researchers to study the relationship between the intake of certain foods and the changes observed in risk factors for various diseases.

Mr.Skeen: How will the funds be used at each center?

Response: The funds will be used by each center as follows:

Beltsville Human Nutrition Research Center, Beltsville, Maryland ($4.8 million) The Center will define the role of food and its components in optimizing health and reducing the risk of nutritionally related disorders in the diverse American population. This includes enhancing and updating the National Nutrient Databank ($1.65 million); development of food composition methods, with particular attention on nutrients that are newly discovered ($0.95 million); investigate energy restriction and physical activity as related to tissue metabolic activity and body composition using mathematical modeling ($0.375 million), identification of markers that are indicative of immune function ($0.5 million);determine the mechanism by which diet alters the immune system ($0.925 million); and enhance dietary survey methodology ($0.4 million).

Grand Forks Human Nutrition Research Center, Grand Forks, North Dakota ($1.6 million) The Center will serve the public by determining nutrient needs for humans and to provide information concerning healthy food choices and a healthful food supply with an emphasis on mineral requirements that prevent disease and promote health and optimal function throughout life. This includes assessing the role of mineral elements and their interactions relative to bone growth, maintenance, and biochemical markers of bone metabolism ($0.8 million); determine the specific metabolic needs for mineral nutriture at each stage of life ($.375 million); and studies of the relationship between mineral nutriture and cognitive function ($0.425 million).

Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts ($1.9 million) The Center will develop information about safe and adequate nutrient intakes and identification of factors that may contribute to degenerative processes associated with aging. This includes assessing the effects of endocrine, genetic and physical factors that affect requirements for nutrients critical to bone health and prevention of osteoporosis in aging adults ($1.0 million); assessing dietary factors that alter vascular reactivity and thereby impact cognitive abilities and brain function in the elderly ($0.3 million); determine the nutritional requirements that are needed to delay the onset of diseases associated with aging ($0.6 million).

Children's Nutrition Research Center at Baylor College of Medicine, Houston, Texas ($2.85 million) The Center will define the nutritional needs of pregnant and lactating women and of their infants and children from conception through adolescence. This includes identifying the alterations in biochemical and neurophysiological regulators of energy intake, energy expenditure and appetite that relate to childhood obesity ($1.0 million); determining factors that affect the ability of rapidly growing children to absorb and utilize minerals from animal and vegetable sources for bone formation ($1.0 million); studies on the effects of dietary factors on biomarkers indicative of optimal synthesis of skeletal muscle protein in the rapidly growing neonate ($0.525 million); and develop an understanding of what nutrients are required, their levels in the diet, and at what point in the development process they are critical ($0.325 million).

Western Human Nutrition Research Center, San Francisco, California ($2.1 million) The Center will improve human health and performance by determining the impacts of dietary, environmental, behavioral, and genetic factors on nutrient requirements and functions. This includes assessing energy restriction for both favorable and detrimental effects including reduced immune response, diminished short-term memory and reduced energy needs ($0.375 million); identification of sensitive biomarkers that can be used to monitor physiological and biochemical factors ($0.975 million); and investigate how the nutritional status of the host can affect emergence of infectious disease agents ($0.750 million).

Arkansas Children's Nutrition Research Center, Little Rock, Arkansas ($4.0 million) The Center will determine the role of nutrition in cognitive and behavioral function, and the health consequences of infant consumption of dietary factors (phytochemicals) such as phytoestrogens on endocrine and metabolic development and prevention of chronic diseases. This includes studies on the determination of the effects of early dietary factors, including the phytonutrients, on long-term consequences of bone growth and maintenance ($0.8 million); studies of the short- and long-term cognitive and social development of growth delayed, malnourished infants and children using neurophysiological techniques ($1.7 million); identification of sensitive biomarkers that can be used early in life that may be indicative of

prevention of certain cancers ($1.0 million) and examine how dietary status early in life alters measures of immune function ($0.5 million).

PFIESTERIA RESEARCH

Mr. Skeen: Please update the Committee on the ARS research activities related to *Pfiesteria*, including your fiscal year 1999 accomplishments, and plans for fiscal years 2000 and 2001.

Response: The Fish Diseases and Parasites Research Laboratory in Auburn, Alabama, has developed tissue culture techniques of fish brain to bioassay *Pfiesteria-like* toxins. The laboratory has also developed quantitative techniques to measure cell death in the fish brains and other fish organs and tissues. In fiscal year 2000, research will be conducted to determine the role of certain genetic characteristics in the regulation of immune response and disease susceptibility in the fish brain. Also, the researchers will use newly-developed bioassay methods to detect potentially beneficial antibodies in the fish, and field studies will be conducted to monitor fish diseases in the U.S. coastal waters if *Pfiesteria* or *Pfiesteria*-like problems do occur.

The Southern Regional Research Center (SRRC) in New Orleans, Louisiana, has initiated research directed at exploring the bio-availability of a variety of agriculturally-derived phosphorus compounds and determining the effects of these compounds on the growth and physiology of *Pfiesteria* and *Pfiesteria*-like species. Microbial species that are able to utilize phytic acid have already been identified. In fiscal year 2000, the physiological effect of phosphorus and related compounds on the population dynamics of these microorganisms will be determined. This information will aid in reducing the impacts of increased nutrient loading from agricultural practices on streams, estuaries, and lakes.

The Environmental Chemistry Laboratory in Beltsville, Maryland, has shown that as much as half the soluble phosphorous in poultry manure is in the organic form of phytic acid. Thus, current treatments can only manage about half the phosphate in poultry manure. Additional strategies to lower the amount of phytic acid are being evaluated as potential solutions to the phosphorus problem, including manure composting and the use of phytase enzymes in poultry feed. Also, procedures are being developed to simultaneously measure organic and inorganic forms of phosphorus under laboratory and field conditions. In fiscal year 2000, a field study will be conducted using poultry manure where the chickens were feed low phytic acid grains. The study also includes evaluating the effectiveness of riparian areas and wetlands associated with the land application of this manure.

The Coastal Plain Soil, Water and Plant Conservation Research Laboratory in Florence, South Carolina, has found using special nitrifying bacteria and a state-of-the-art pilot bioreactor reduced the amount of ammonia available for volatilization from a lagoon can be reduced by 60 to 90 percent. In fiscal year 2000, a new generation waste treatment technology for solid-liquid separation of swine manure will be tested. Also, polyacrylamide flocculants and quick-drying filter beds will be tested to reduce nitrogen and phosphorus levels in the swine manure.

Mr. Skeen: Include a table for the record that identifies the research, by location, the dollar and staff devoted to this research, by fiscal year.

[The information follows:]

Location	FY 1999	SYs	FY 2000	SYs	FY 2001	SYs
Auburn, AL	$191,400	0.4	$195,000	0.8	$195,000	0.8
New Orleans, LA	248,300	0.9	253,400	1.3	253,400	1.3
Beltsville, MD	292,300	0.7	298,200	0.8	573,200	0.8
University Park, PA	--	--	--	--	300,000	1.0
Florence, SC	69,600	0.1	179,800	0.7	179,800	0.7
TOTAL	801,600	2.1	926,400	3.6	1,501,400	4.6

Mr. Skeen: Please provide a table showing other Federal funds being spent or requested to address this problem?

Response: The major Federal agencies addressing this problem are the U.S. Department of Agriculture, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the National Institute of Environmental Health and Safety, the Centers for Disease Control, the U.S. Department of Interior, the U.S. Food and Drug Administration, and the National Science Foundation.

GLOBAL CHANGE

Mr. Skeen: What resources, in terms of ARS funding and staff, are being expended on this effort in fiscal year 2000? How would the $7.9 million be used?

Response: In the current fiscal year, a total of $13,042,600 is expended on global change research by ARS, involving the equivalent of 38 full-time scientists. This effort is independent of $14,854,800 expended on research on alternatives to methyl bromide. Objectives of specific ARS research projects on global change target four broad goals: understand and quantify agriculture's role in the production and removal of greenhouse gases from the atmosphere; determine the impact of global change on the sustainable production of food and fiber; identify the most efficient and sustainable ways for farm and rangeland managers to adapt to a changing climatic and chemical environment; and develop technologies and methods for the agricultural community to help mitigate the causes and effects of global change.

An increase of $7,900,000 is requested for global change research in fiscal year 2001. Of that, $4,700,000 is requested for research to develop new information on the carbon cycle, $2,000,000 will be directed to research on ways to mitigate climate change impacts on food availability, $400,000 is for research on the impacts of atmospheric and climate change on Alaskan agro-ecosystems, and $800,000 will be used to conduct U.S. Global Change Research Program National Assessment activities. Research on managing agricultural and rangeland systems to capture atmospheric carbon and store it in soil as a way to mitigate climate change has many benefits to soil, water, and air quality on and off the farm. Research on impacts on food availability will identify mechanisms of how food crops respond to global change stresses, how much variation in response occurs among cultivars of crops, and how crop interaction with weeds is modified by environmental change. This work is important to maintaining the long-term security of the Nation's supply of food and fiber. Research in Alaska is important because the earliest and greatest impacts of climate change may occur in high latitudes, thus, studying climate change in Alaska can yield information on how farmers may adapt and even take advantage of beneficial impacts of global change, including availability of potential new croplands. The National Assessment will satisfy the mandate of the Global Change Research Act of 1990 (P.L. 101-606) to prepare and submit to the President and the Congress "an assessment which integrates, evaluates, and interprets the findings" of the U.S. Global Change Research Program. The Assessment will communicate the Program's

growing body of information about global change to the public, the scientific community, and government officials, and it will demonstrate the public-private partnership that links research to the needs of stakeholders and policy makers.

Mr. Skeen: Please provide an object class table that supports your request.

Response: The object class table supporting the increase for global change research will be provided for the record.
[The information follows:]

OBJECT CLASS TABLE

		Total
Personnel Compensation		
11.0	Personnel compensation	1,495,000
12.0	Personnel benefits: Civilian Retirement	344,000
	Total Personnel Compensation & Benefits	1,839,000
Other Services:		
21.0	Travel and transportation	221,000
23.0	Rent, communications, utilities	402,000
24.0	Printing and reproduction	16,000
25.0	Other services	4,025,000
26.0	Supplies and materials	830,000
31.0	Equipment	567,000
	Subtotal, All Other	6,061,000
Total, ALL OBLIGATIONS		7,900,000

Mr. Skeen: What results have been obtained to date from ARS research in this area?

Response: ARS scientists have demonstrated that rising concentrations of greenhouse gases in the atmosphere affect crop production in complex ways and that agriculture can play an important role in sequestering atmospheric carbon, thereby mitigating adverse impacts of global change. Research has demonstrated that increased carbon dioxide can stimulate plant growth and crop yield, but extensive work at numerous ARS locations has shown that many other effects of carbon dioxide and projected climatic changes (temperature and water availability) on plants must be considered before the risks, benefits, and appropriate management strategies can be identified. Increased carbon dioxide can alter plant morphology and physiological processes, leading to increased yield and changes in quality. As ARS research shows, however, crop management in a changing global environment must consider numerous factors that can modify such effects, such as species and varietal differences in crop response, changes in soil moisture availability and ambient temperatures, stressors such as tropospheric ozone and UV-B radiation, altered interactions between crops and pests, and effects of carbon dioxide on weed growth and response to herbicides. Analyses by ARS scientists demonstrated that conservation tillage practices adopted by U.S. farmers during recent decades for improving soil tilth and reducing erosion have had the added benefit of switching U.S. croplands from a net producer to a net accumulator of carbon sometime in the last 15 years. Other analyses by ARS researchers showed that if further conservation practices are adopted, agricultural soils can sequester still more carbon and potentially help mitigate adverse effects of increasing concentrations of greenhouse gases, in addition to providing broad benefits to soil and water quality. Increased variability of weather is expected to accompany climate change and will carry

increased risks for producers. An ARS analysis of precipitation in the Southern Great Plains found that variability since 1980 has been as much as one-third greater than that during the previous 85 years. Knowledge of weather variability is important in plans for managing production risks. Thus, information from ARS research will play a key role in management decisions affecting both greenhouse gas concentrations and the sustainability of agriculture in a changing global environment.

ASIAN LONGHORN BEETLE

Mr. Skeen: Please update the Committee on the research underway to control and eradicate the Asian Longhorn Beetle.

Response: The Asian longhorn beetle (ALB) is a new exotic pest to the U.S. Major infestations have become established in New York State (NYC area) and Chicago, with reports of beetles discovered in warehouse cargo in Alabama, California, Florida, Georgia, Indiana, Maine, Massachusetts, Michigan, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Washington, and Wisconsin. The beetle larvae bore into hardwood and cause severe damage to many trees, including sugar maples. Action agencies have been attempting to eradicate the beetle by destroying infested trees.

ARS has developed a research program in alignment with a Science Advisory Panel convened to address programmatic needs, as verified by the states of New York and Illinois and the USDA Forest Service. Congressionally appropriated new funds are being used to support both State and Federal agencies. ARS is developing technologies that will be used by APHIS for eradication. Long-term management strategies are being developed in the event that this pest cannot be eradicated. ARS has developed a 5-year research and action plan with its cooperators that include ALB fundamental biology and systematics; population ecology and dispersal; detection and survey; biological control; chemical, cultural, and mechanical control; and integrated pest management.

Newark, Delaware: At the ARS Beneficial Insects Introduction Research Unit, work has progressed in determining ALB biology (in collaboration with the State University of New York at Syracuse). ALB was found to disperse 1400 m per year, much farther than the 100-200 m previously reported. This information can be used by APHIS to readjust quarantine boundaries. Also, in collaboration with ARS' Sino-American Biological Control Laboratory and the Chinese Academy of Forestry, work has been initiated to define the natural complex of the ALB and related beetles in China, information necessary for importation of natural enemies of the beetle. A wasp and a parasitic beetle show particular promise as biological control agents. Finally, improved methods for detecting infested trees are being developed in collaboration with the State University of New York at Syracuse. Movements by ALB larvae can be differentiated from carpenter ants, even against significant background noise. Currently, APHIS is relying on sight to identify beetle holes in trees to determine which trees need to be removed.

Beltsville, Maryland: New research at the ARS Systematic Entomology Laboratory will assist field personnel to more accurately identify ALB and to separate this beetle from other species that exist in the same geographical area. A 40 species monograph of beetles in the ALB genus will be released in late 2000. Identification aids and systematic revisions are being developed with Cornell University as a cooperator. At the ARS Insect Chemical Ecology Laboratory, beetle-produced odors have been isolated that attract ALB in laboratory tests; however, these chemicals were not attractive to the beetles in the field in China in 1999; studies continue.

Cornell University (ARS cooperator): Work is underway to identify and develop pathogens from the ALB's native distribution, as well as to evaluate North American strains of a fungal pathogen used extensively to control beetle pests (including development of bait trap methods for pathogen auto-dissemination), to develop wood-and cellulose-based diets for rearing ALB, to translate Chinese literature and, in cooperation with Beltsville, Maryland, to prepare an identification guide. Integrated pest management support is being provided to Newark, Delaware.

ERGOT DISEASE

Mr. Skeen: Please update the Committee on the research you are doing in connection with ergot disease.

Response: The research on sorghum ergot is aimed at increasing sorghum's resistance to ergot through conventional breeding and biotechnology, developing chemical control strategies, characterizing the genetic variability and other properties of the ergot pathogen, characterizing ergot epidemiology to identify possible points of control and evaluating sorghum germplasm for resistance to ergot.

Mr. Skeen: What research locations are involved?

Response: The research locations involved in sorghum ergot research are College Station, Texas; Frederick, Maryland; and Lincoln, Nebraska.

GUAYULE

Mr. Skeen: Please update the Committee on the research you are doing in connection with guayule, by location, including accomplishments.

Response: ARS research on guayule addresses both production and utilization of the guayule plant. At Phoenix, Arizona, we are developing varieties with improved agronomic properties, salinity and disease tolerance, and cost-effective production management practices. At Albany, California, we are conducting biotechnology research to identify key enzymes and structural proteins required for latex synthesis and subsequent genetic engineering to enhance latex yield. Collaborative research between Phoenix and Albany is concerned with development of extraction and isolation procedures, and preparation of the guayule latex for product evaluation.

Success in increasing the yield of guayule rubber and coproducts through breeding and improved agronomic practices continues. Plant yields are now 200 percent higher than those obtained from standard USDA lines dating to the 1950's. Success in commercialization of the process developed for extraction of the hypoallergenic guayule latex continues. Guayule latex unlike Hevea rubber latex does not induce allergies. This is particularly important to the medical, dental, and health care workers who may become severely allergic over time to Hevea latex. Patents and exclusive licenses have been issued for the process of guayule latex isolation. ARS scientists at Albany, California, have received funding from Yulex Corporation to produce sufficient quantities of guayule for use in fabricating medical products for testing purposes. The information derived in obtaining the latex will help in developing a commercial-scale extraction facility.

Mr. Skeen: By location, what is the funding and staff for guayule research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Phoenix, AZ	$227,200	0.9	$231,900	0.9	$231,900	0.9
Albany, CA	283,100	0.7	288,500	0.8	688,500	1.8
Fresno/ Parlier, CA	47,300	--	32,100	--	32,100	--
Total	557,600	1.6	552,500	1.7	952,500	2.7

FUNGAL PHYTASE

Mr. Skeen: What is the status of research on the genetic engineering of fungal phytase to reduce groundwater contamination?

Response: Phytase research has centered on improving fungal phytase as an animal feed additive to reduce phosphorus levels in manure from non-ruminant animals (pigs, poultry, etc.). The problem of phytic acid, a natural phosphorus storage component in cereals and grains, has created a major problem in animal agriculture as the use of soybean meal has increased. Non-ruminant animals lack an enzyme, phytase, in their digestive system to digest this compound; thus, phytin phosphorus is excreted in their manure. As the size of animal production units have increased, the ability of many U.S. soils to store this phosphorus has been exceeded and now it threatens to contaminate groundwater and surface waterways. ARS scientists at the Southern Regional Research Center in New Orleans, Louisiana, are utilizing advanced genetic engineering techniques to produce an enzyme superior to the native fungal phytase that is now commercially available. The engineered phytase combines both high heat tolerance and enhanced activity at a lower unit cost. Lowering the cost of this enzyme technology will hopefully accelerate its acceptance by the animal feed industry. Joint research with other scientists in evaluating other systems to further lower production cost of phytase is underway. This location received a program increase of $250,000 in fiscal year 1999 for research on Pfiesteria and other harmful algal blooms as it relates to fungal phytase and water quality contamination.

Mr. Skeen: By location, what is the funding and staff for this project in fiscal years 1999, 2000 and 2001?

Response: Fungal phytase research is being conducted at New Orleans, LA. The funding in fiscal year 1999 was $801,000 with 2.8 scientists. Funding in fiscal year 2000 is $817,400 with 4.1 scientists. It is estimated to be the same in fiscal year 2001.

HOPS RESEARCH

Mr. Skeen: Please update the Committee on the 1999 accomplishments of Hops research activities and give an explanation of the impacts of proposed decreases in fiscal year 2001.

Response: Hops research in ARS includes genetics and breeding for the development of new germplasm and varieties that are more pest resistant. Powdery mildew is a new, major disease threat to the Pacific Northwest hop industry. Present varieties are susceptible, so the industry has to rely on chemical sprays to control mildew. In 1999, extensive crosses were completed to combine genes for resistance to powdery mildew into culturally acceptable hop germplasm. New hop genes linked to anti-fungal activity were cloned to better understand the molecular basis of powdery mildew resistance. Also, male hop germplasm with aphid resistance was developed and publicly released.

Proposed decreases in the 2001 Administrative budget would have the following impacts:

(1) Additional funds were used to expand the evaluation of hop germplasm for mildew resistance and agronomic performance to a semi-arid location, typical of many hop production areas. Advanced breeding lines and a back-up of the USDA hops collection have been planted. This planting and germplasm evaluation can not be maintained if funds are decreased.

(2) The National Germplasm Clonal Repository at Corvallis, OR, serves as a site of importation for foreign hops germplasm. Additional funds were used to remove disease agents from imported hops germplasm, so that this germplasm could be used effectively by the genetics and breeding program. This development of new germplasm sources for the genetics and breeding program cannot be maintained if funds are decreased.

(3) A post-doctoral molecular biologist was hired to clone genes for powdery mildew resistance and identify DNA markers for genetic selection. Genes that are critical for mildew resistance are being identified and cloned. This research will be discontinued if funds are decreased.

Mr. Skeen: Please provide a table by location highlighting the funds and staff devoted to Hops Research in fiscal years 1999, 2000, and 2001.

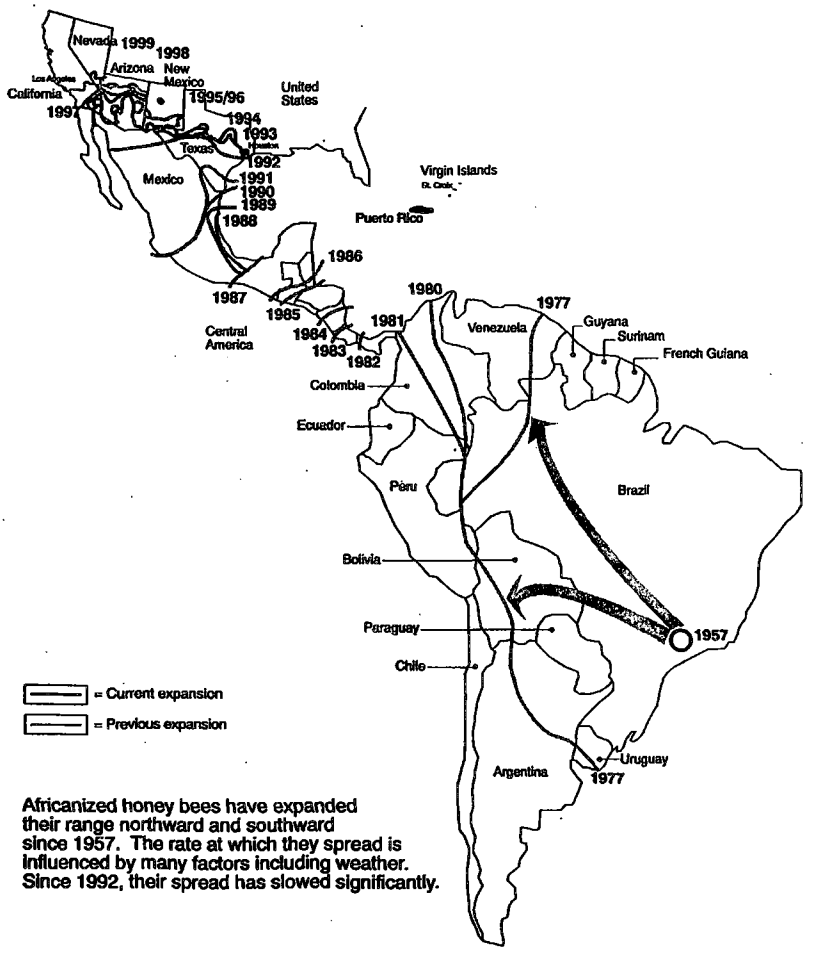
Response: ARS conducts hops research in Corvallis, Oregon. ARS cooperates with scientists at Washington State University (WSU), Prosser, Washington, and provides funds to WSU for cooperative research. ARS hops research in Corvallis was funded at $479,400 in fiscal year 1999, which supported 1.2 research scientists and a postdoctoral research associate. Technicians were also supported to maintain the USDA hops germplasm collection, and to plant and evaluate breeding and genetic lines. In fiscal year 2000, ARS hops research at Corvallis was funded at $489,500, which supported 1.2 research scientists, a postdoctoral research associate and technical staff. Funding proposed in 2001 to Corvallis, Oregon, is $337,600 which will support 1.2 research scientists and technical staff.

AFRICANIZED BEES

Mr. Skeen: Would you please provide for the record a map similar to the one provided last year that shows the advance of the Africanized bee, by year?

[The information follows:]

Migration of Africanized Honey Bees



Africanized honey bees have expanded their range northward and southward since 1957. The rate at which they spread is influenced by many factors including weather. Since 1992, their spread has slowed significantly.

Mr. Skeen: Please describe any progress you are making in connection with Africanized bees and your plans for fiscal year 2000 and 2001.

Response: ARS supports USDA and State action and regulatory programs and the concerns of the beekeeping industry through Africanized honey bee research at four laboratories. The Bee Research Laboratory at Beltsville, Maryland, develops new techniques for Africanized honey bee identification and genetic characterization of honey bee populations in the New World, and provides authoritative identification services and training for regulatory agencies. A polymerase chain reaction-based (PCR) method has been developed to identify Africanized bee populations from stingers collected from victims. This method assists regulatory and public health agencies to monitor and control this behaviorally aggressive species. A DNA fingerprinting method is helping in the assessment of effects of Africanization on honey bee stocks and in the evaluation of effectiveness of regulatory efforts to control Africanized honey bee populations. At the Honey Bee Breeding, Genetics and Physiology Research Laboratory in Baton Rouge, Louisiana, research emphasis is given to manipulation of the genetic process of Africanization and the utilization of mite-resistant bee strains from Russia. Research at the Honey Bee Research Laboratory, Weslaco, Texas, focuses on the management of European and Africanized honey bees, monitoring changes in feral honey bee populations, and mitigating the impact of Africanization on pollination of fruit and vegetable crops. At the Carl Hayden Bee Research Center, Tucson, Arizona, scientists are improving and developing new methods for personal protection from Africanized honey bee stinging incidents, and monitoring mite and disease resistance. They are developing new hive bait technologies and improved methods for monitoring the process of Africanization in arid environments. They have developed traps that capture and destroy unwanted Africanized bee swarms in areas of high public use, or other sensitive areas. They have transferred the personal protection technology to professionals and the general public; for example, they have developed techniques for rescue workers to intervene in major stinging incidents.

Plans for fiscal year 2000 and 2001, are focused on (1) improvement in our knowledge of the mating advantage of the Africanized drone and thus the Africanization process; (2) Monitoring the population dynamics of Africanized bees in predominantly European bee region; and (3) development of a simple method of finding, removing, and repelling Africanized bees.

Mr. Skeen: Please provide for the record the fiscal years 1999, 2000 and 2001 funding and staff assigned to the Africanized bee program, by location.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Tucson, AZ	$ 366,600	2.0	$ 373,900	1.7	$ 373,900	1.7
Baton Rouge, LA	735,000	1.8	750,400	2.3	750,400	2.3
Beltsville, MD	326,300	1.2	370,600	1.3	370,600	1.3
Weslaco, TX	193,400	0.8	197,200	0.8	197,200	0.8
TOTAL	1,621,300	5.8	1,692,100	6.1	1,692,100	6.1

HONEY BEE

Mr. Skeen: By location, provide a table showing the funding and staff devoted to honey bee research in fiscal years 1999, 2000, and 2001.

Response: The dollars and staff years devoted to the Honey Bee Program in research in fiscal years 1999, 2000, and 2001 will be provided for the record. The listed information includes $6,003,300 for honey bee research and $1,005,800 for other pollinating insects research at Logan, UT.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Tucson, AZ	$1,003,800	4.8	$1,302,300	5.0	$1,302,300	5.0
Baton Rouge, LA	1,392,200	4.0	1,421,300	5.0	1,421,300	5.0
Beltsville, MD	1,926,500	8.0	1,965,400	7.0	1,965,400	7.0
Weslaco, TX	1,289,300	5.3	1,314,300	5.3	1,614,300	6.3
Logan, UT	986,700	3.9	1,005,800	3.9	1,005,800	3.9
TOTAL	6,598,500	26.0	7,009,100	26.2	7,309,100	27.2

IR-4 RESEARCH

Mr. Skeen: Please update the Committee on the IR-4 program and IR-4 projects selected to date, including IPM programs.

Response: The IR-4 program is a cooperative program among Federal, State, and Industry scientists to register minor uses of pesticides. Major research components to develop performance and residue data lie within USDA-ARS, USDA-CSREES, the State agricultural experiment stations, and private industry. A staff headquartered at Rutgers University maintains files, tracks projects, prepares research protocols, and develops petitions for submittal to regulatory agencies and the chemical registrants. The program is guided by an Administrative Advisory Committee and a Project Management Committee. The ARS Administrator represents ARS on the Advisory Committee and one of our scientists represents ARS on the Project Management Committee. In addition, ARS conducts field experiments to determine pesticide efficacy and performs laboratory analyses to determine pesticide residues.

The following represents the IR-4 projects selected for the 2000 season: Magnitude of the residue studies-Field:113, Laboratory:71 Ornamental Projects:252. The judicious use of chemicals is an integral part of IPM programs. IPM chemical needs are identified and prioritized together with other IR-4 needs. In addition, IR-4 is assisting in the registration of biopesticides useful for IPM programs. To help coordinate the IPM-related activities the National Director of IR-4 serves on the CSREES Pest Management Strategies Subcommittee.

Mr. Skeen: By location, what is the funding and staff for IR-4 research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Salinas, CA	$137,000	--	$138,600	--	$163,600	--
Washington, DC	76,100	--	77,000	--	77,000	--
Tifton, GA	627,000	0.2	634,600	0.2	660,600	0.2
Urbana, IL	10,000	--	10,100	--	10,100	--
Beltsville, MD	363,300	1.8	367,700	1.05	675,100	1.05
Wooster, OH	99,800	--	101,000	--	150,100	--
Corvallis, OR	60,100	--	60,800	--	156,100	0.2
Charleston, SC	61,000	0.2	61,800	0.2	156,200	0.2
Weslaco, TX	109,500	0.05	110,800	--	141,100	--

Prosser, WA	87,000	--	88,100	0.15	133,900	0.15
Yakima, WA	437,300	0.11	442,600	0.04	469,300	0.04
California	--	--	--	--	150,000	0.2
Florida	--	--	--	--	150,000	0.2
Total	2,068,100	2.36	2,093,100	1.64	3,093,100	2.24

Mr. Skeen: What is the total USDA budget for IR-4 for fiscal years 1999, 2000, and 2001, by agency and by program?

[The information follows:]

Agency	FY 1999	FY 2000	FY 2001
ARS	$2,068,100	$2,093,100	$3,093,100
CSREES SRG	8,990,000	8,990,000	10,711,000
Total	11,058,100	11,083,100	13,804,100

JOINTED GOAT GRASS CONTROL RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing and progress made in connection with jointed goat grass control research, by location.

Response: Research on jointed goatgrass is currently being undertaken at Akron, CO, and Pullman, WA. At Akron, we are developing integrated management systems to minimize weeds, including jointed goatgrass, in various cropping systems. Research in Pullman involves development of information on biology and ecology of jointed goatgrass, identification of wheat traits to enhance competitiveness with goatgrass, development of an integrated management systen to control goatgrass in dryland winter wheat, and screening of winter wheat germplasm for competitiveness with goatgrass.

A cropping system, including long-term crop rotations, cultural systems, and in-crop mowing, has been shown to be effective for control of jointed goatgrass and other winter annual grasses. Crop rotation and burning crop stubble significantly reduced live jointed goatgrass seed. Traits of winter wheat which improved the competitiveness of wheat in the presence of jointed goatgrass were 1) increased wheat height development rate and increased final wheat tiller numbers in a dry year and 2) increased final tiller numbers and increased water use during a wet year. Winter wheat cultivars with potentially competitive traits were selected for testing. In addition, herbicides were tested on jointed goatgrass planted with an herbicide-resistant wheat variety.

Mr. Skeen: By location, what is the funding and staff for jointed goat grass control research for fiscal years 1999, 2000, and 2001?

Response: ARS funding and scientific staff years on jointed goatgrass control research by location for fiscal years 1999, 2000, and 2001 follows:

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Akron, CO	$133,600	0.5	$136,400	0.5	$136,400	0.5
Pullman, WA	143,800	0.7	146,600	0.7	146,600	0.7
	277,400	1.2	283,000	1.2	283,000	1.2

KENAF

Mr. Skeen: Please update the Committee on the work you are doing and

progress made in connection with kenaf, by location.

Response: More than 6,000 acres of kenaf were planted in 1999 in Texas, Mississippi, and Missouri. ARS has kenaf research underway at two locations and helps fund research at a third. ARS cooperates with scientists at Mississippi State University to develop applications and markets for kenaf and the development of harvesting and fiber processing systems. At Athens, Georgia, research focuses on biotechnological ways of separating kenaf fiber from the stalk of the plant. Research at New Orleans, Louisiana focuses on developing technologies for the processing of kenaf fiber into non-woven mats, incorporation of the fiber into resin-reinforced fiber board, and development of kenaf/cotton fabrics.

Through the agronomic work at Stoneville/Mississippi State University, Mississippi, management of the crop has been refined with emphasis to the region where kenaf is grown. ARS and ARS-cooperator research has demonstrated commercial targets for kenaf products: oil spill adsorbent, drilling mud component, greenhouse and mulch growth medium, insulation paneling and as a component in reinforced thermoplastics for automobile door and head liners. Additional studies in Mississippi show kenaf's potential as a concrete aggregate. ARS scientists are exploring kenaf's potential in the bioremediation of selenium- and boron-contaminated soils in California's San Joaquin Valley. Core Products Co., Mississippi, is marketing kenaf core for animal litter. ARS in Athens, Georgia, is exploring novel biotechnological ways to separate the fiber component from kenaf.

Mr. Skeen: By location, what is the funding and staff for kenaf research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Athens, GA	$101,300	0.5	$103,200	0.5	$103,200	0.5
New Orleans, LA	144,000	0.3	147,000	0.3	147,000	0.3
Stoneville, MS	482,800	0.1	268,700	0.1	--	--
	728,100	0.9	518,900	0.9	250,200	0.8

LOCOWEED RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing and progress made in connection with locoweed research, by location.

Response: Research on locoweed is currently being undertaken at Logan, Utah, and under a cooperative agreement of this laboratory with New Mexico State University. This research has improved assays to monitor and diagnose intoxication, more clearly described the pathologic changes of poisoning, determined locoweed toxin (swainsonine) clearance times from animal tissues and products, and developed management and withdrawal procedures to assure that animal products are toxin free.

Additional research has determined that locoweed ingestion alters breeding behavior in males and females early in the toxicosis, interferes with normal testicular and ovarian function, causes embryo/fetal loss, and in advanced toxicoses has shown that permanent neurological changes preclude recovery of normal reproductive function. Recommendations to prevent toxicity include avoiding exposure to locoweed for males at least 90 days before breeding, increasing the ratio of males to females and limiting/preventing exposure to

locoweed for pregnant females.

The relationship of species, habitat, palatability and toxin formation has been investigated. White locoweed growing in the eastern foothills of the Rocky Mountains in Colorado and Wyoming, is palatable to cattle throughout the spring and summer growing season. Summer precipitation allowed locoweed leaves to continue to grow and remain succulent throughout the summer. This is in contrast to White locoweed growing in northern New Mexico where it matures in late spring and early summer and becomes less palatable in relation to warm season grasses that are abundant.

Lambert locoweed (*Oxytropis lambertii*) growing in north central Colorado and northeastern New Mexico did not contain the locoweed alkaloid swainsonine. Lambert locoweed historically has been one of the major species associated with causing locoism. Further research will be conducted to determine if other Lambert locoweed populations contain swainsonine and if there are other toxic indolizidine alkaloids present.

Mr. Skeen: By location, what is the funding and staff for locoweed research for fiscal years 1999, 2000, and 2001?

Response: The funding for locoweed research at Logan, Utah, was $635,600 in fiscal year 1999. For fiscal years 2000 and 2001, funding is projected to be $647,400 each year, with two ARS scientists working on locoweed research. Out of these funds, about $114,000 each year supports a cooperative agreement with New Mexico State University.

LOW-INPUT SUSTAINABLE AGRICULTURE

Mr. Skeen: Please update the Committee on the work ARS has underway in the field of low-input sustainable agriculture, including 1999 accomplishments and plans for fiscal year 2000 by location.

Response: Every project is evaluated in regards to its contribution to sustainable agriculture. Recent analysis of the ARS research program indicates that more than 35 percent or approximately 400 projects of the total program contributes to low-input sustainable agriculture. Classification as "contributing" is based on the program contributing to two or more of the following criteria: integrates plant and animal production practices into cost effective production systems; satisfies human food and fiber needs; enhances environmental quality; conserves or enhances natural resources; improves utilization of biological resources; increases economic viability; or enhances quality of life. The percentage of ARS projects that contribute to sustainable agriculture has been increasing. Some major accomplishments in fiscal year 1999, included the development of on-farm projects on organic farming that address a variety of topics, such as weed control, agroforestry, non-chemical alternatives to methyl bromide and non-chemical control of parasites in livestock and poultry. In addition, low-input sustainable agricultural methods for weed, pest and disease control; soil fertility, quality and management; and alternative animal production systems were developed in 1999. Decision support systems such as GPFARM, a whole farm/ranch management tool for Great Plains producers, and EXNUT, a management tool for peanut producers that gives expert advice on irrigation scheduling, insect and disease alerts, and pest control practices, were released in 1999. The customer and stakeholder workshop for the Integrated Agricultural Systems National Program was held in December 1999. Many producers and representatives from sustainable agriculture organizations participated in this workshop. Farmers and ranchers interested in low-input sustainable agriculture also participated in other national program workshops and other ARS activities. In general, additional emphasis is being placed on

cooperating directly with producers and organizations by conducting farmer participatory research activities on sustainable and organic farming systems. For instance, five additional projects on organic farming are starting in 2000. They will be conducted at various locations across the country. The funding for this research is from the ARS Administrator's discretionary funds, indicating the agency's commitment to low-input sustainable agriculture. The cooperative activities are intended to demonstrate the applicability of research results under the scale and within the system constraints faced by low-input sustainable agricultural systems and organic producers.

Mr. Skeen: By location, what is the ARS funding and staff for low-input sustainable agriculture for fiscal years 1999, 2000, and 2001?

Response: Nearly every ARS location has a project that contributes to sustainable agriculture. Approximately 400 projects on sustainable agriculture are carried out in 39 States, and U.S. Territories, and foreign countries with soil and climate conditions representative of all the major U.S. crop and animal production areas. ARS research contributing to sustainable agriculture was $272,185,000 for fiscal year 1999; is $304,232,000 for fiscal year 2000; and $292,586,000 is proposed for fiscal year 2000. ARS staff contributing to sustainable agriculture was 815.7 for fiscal year 1999; is 884.8 for fiscal year 2000; and 851 is proposed for fiscal year 2001.

Mr. Skeen: What is the total USDA program, by agency, for low-input sustainable agriculture for fiscal years 1999, 2000, and 2001?

Response: The USDA budget for sustainable agriculture research and extension will be provided for the record.

[The information follows:]

	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
ARS	$272,185,000	$304,232,000	$292,586,000
CSREES	125,648,000	130,545,000	141,333,000
TOTAL	397,833,000	434,777,000	433,919,000

LYME DISEASE RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing in connection with Lyme disease research, by location, including 1999 accomplishments and plans for fiscal year 2000.

Response: In 1997, ARS launched a project called the Northeast Area-wide Tick Control Project to achieve a dramatic reduction of Lyme ticks and, consequently, an equally dramatic reduction in Lyme disease risk for humans. This Demonstration Project is based on a cooperative effort between USDA-ARS and a consortium of universities and State agencies and is being conducted in Connecticut, Maryland, New Jersey, New York, and Rhode Island.

The project uses a passive topical treatment system termed the '4-poster', which was invented by ARS to provide a means for controlling the tick, *I. scapularis*, on deer. The majority (83-89 percent) of female *I. scapularis* attach to the head, neck, shoulders, and brisket. The deer come to feed on corn and as they rub against the rollers of the '4-poster' devise, they are treated with the acaricide, Amitraz. The hair from the neck and head regions of the darted deer are being analyzed for the presence of acaricide to determine the proportion of deer being treated by the '4-poster' at each site.

In August of 1997, 25 '4-posters' were installed at one 2-square mile site in each of the 4 states - Connecticut in the town of Old Lyme, New London

County; New York in the town of Bedford, Westchester County; New Jersey at the Naval Weapons Station Earle, Monmouth County; and Rhode Island in the town of Narrangansett, Washington County.

Pretreatment operation of the devices began in September of 1997 to accustom deer to come to corn bait before the start of host-seeking activity of adult black legged deer (Lyme) ticks in October. By November, all devices were fully operational with the application of the acaricide, Amitraz, on the four rollers of each device.

In Maryland, the pretreatment operation started in the first week of February 1998. The project is being conducted at three sites, which include the Beltsville Agricultural Research Center in Prince Georges County; Phoenix-Loch Raven in Baltimore County; and Gibson Island in Anne Arundel County. Acaricide application began in late March 1998.

In RI, CT, NY, NJ, and MD deer have become accustomed to the '4-poster' devices as indicated by corn consumption. We are experiencing a four to five fold increase in deer density in CT and NY respectively than the anticipated number of 20 deer per square mile.

Sampling of larval tick populations commenced in August, 1998. Results form this sampling will provide the first indication of the effectiveness of the '4-poster' devices. It is expected that significant numbers of adult female ticks on deer will be killed, thus reducing the total numbers of eggs laid. This will result in a reduction in the larval tick population.

At each site in RI, CT, NY, NJ, and MD samples of adult ticks from the treatment and control sites are being recorded during the peak tick season, including adult ticks during the fall, nymphal ticks during early summer, and larval ticks during mid to late summer. These data will be used to assess the efficiency of the '4-poster' devices in reducing the adult tick population at the end of the two years of the project (to match with the 2-3 year life cycle of Lyme tick).

The '4-poster' study has just completed its second year and only preliminary data has been gathered, which indicates significant reduction in nymphal ticks that carry the Lyme disease agent. A better assessment of the impact of this project will be available after the tick density is obtained this summer and fall. Other problems include corn waste caused by squirrel feeding (they take one bite from a kernel then discard it); to counter this problem, ARS provided contingency funds to pay for the cost of extra corn and to install squirrel excluders designed by ARS scientists. Depending on the outcome of the '4-poster' study, ARS will develop strategies to further evaluate and improve the '4-poster' technology by extending the test to other locations. ARS has also been requested by health authorities in PA and MA to extend the '4-poster' study to their states.

In January of 1998, ARS scientists in Kerrville, Texas invented an exclusion device (shortly to be installed on the '4-posters' in RI and CT) to prevent squirrels, racoons, and birds from feeding on corn in the '4-poster' devices.

Mr. Skeen: By location, what is the funding and staff for Lyme disease research for fiscal years 1999, 2000, and 2001?

Response: The funding and staff for Lyme disease research at Beltsville, MD is $1,100,400 for fiscal year 1999; $1,310,200 for fiscal year 2000; and $762,200 proposed for fiscal year 2001 with 1.8 scientists for each year.

METHYL BROMIDE RESEARCH

Mr. Skeen: For the record, please provide a table highlighting the fiscal year 1999, 2000, and 2001 funding and staff devoted to methyl bromide research by location.

Response: The ARS funding and staff by location for fiscal years 1999, 2000, and 2001 will be provided for the record. In addition, the Secretary had designated $800,000 of Commodity Credit Corporation (CCC) funds in fiscal year 2000 to evaluate propargyl bromide for strawberries, tomatoes, peppers, ornamental plants, and other methyl bromide-impacted crops.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Davis, CA	$226,000	0.9	$230,000	0.9	$230,000	0.9
Fresno/ Parlier, CA	3,485,400	11.2	3,551,800	11.4	3,861,800	12.4
Riverside, CA	126,600	0.5	133,700	0.5	133,700	0.5
Salinas, CA	535,900	2.0	674,200	2.0	674,200	2.0
Washington, DC	241,200	1.0	245,900	1.1	245,900	1.1
Ft. Pierce, FL	1,597,100	5.5	1,622,200	5.5	1,932,200	6.5
Gainesville, FL	213,000	0.9	217,500	0.9	217,500	0.9
Miami, FL	1,219,300	4.0	1,241,900	4.0	1,241,900	4.0
Byron, GA	83,900	0.2	85,500	0.2	85,500	0.2
Tifton, GA	462,200	1.6	472,000	1.7	472,000	1.7
Hilo, HI	1,684,700	3.2	1,714,500	3.2	1,714,500	3.2
Manhattan, KS	70,800	0.3	72,200	0.3	72,200	0.3
Beltsville, MD	1,048,200	3.1	1,108,900	3.1	2,108,900	6.1
Stoneville, MS	182,200	0.9	188,100	0.9	188,100	0.9
Corvallis, OR	487,400	1.3	511,700	1.3	511,700	1.3
Charleston, SC	330,600	1.1	337,500	1.1	337,500	1.1
Weslaco, TX	1,482,900	5.1	1,511,600	5.1	1,511,600	5.1
Wenatchee, WA	209,200	0.7	214,000	0.7	214,000	0.7
Yakima, WA	258,000	0.9	264,000	0.9	264,000	0.9
Kearneysville, WV	435,000	1.4	457,600	1.4	457,600	1.4
Total:	14,379,600	45.8	14,854,800	46.2	16,474,800	51.2

Mr. Skeen: Please update the Committee on your fiscal year 1999 accomplishments in connection with methyl bromide research and your plans for fiscal years 2000 and 2001.

Response: The Agricultural Research Service (ARS) considers providing farmers and other methyl bromide users with effective, economical, and environmentally acceptable methyl bromide replacements among its top priorities. The ARS and other USDA agencies are working with the U.S. Environmental Protection Agency (EPA); States; industries, including the Crop Protection Coalition, to address high priority needs of commodities and products in both soil and postharvest fumigation. Between 1993 and 1999, ARS has provided over $2 million in extramural funds to universities, primarily for research by university scientists in the severely impacted states of Florida and California, to develop methyl bromide alternatives for soil fumigation/postharvest uses.

ARS co-leads, with EPA, a USDA/EPA Methyl Bromide Working Group, established by the USDA Secretary and EPA Administrator, that reviewed in 1999 potential methyl bromide alternatives for efficacy and EPA registration status. A long list of action items has been identified relative to registration and some registration problems were recently resolved due to that effort. ARS, in cooperation with EPA, is currently sponsoring several

meetings with methyl bromide alternatives registrants, growers, State agricultural officials, scientists, and environmental regulatory officials to discuss and resolve regulatory hurdles to adoption of promising methyl bromide alternatives.

In 1999, ARS reviewed its methyl bromide research program with growers and other methyl bromide users at meetings in Florida and California to receive input on the methyl bromide research program to make sure it is properly focused on the highest priority problems. In addition, ARS organized a field trip for USDA and EPA personnel to study issues particular to the floral and nursery industries in California. The USDA participates in joint research with Canada through the Canada/US Working Group on alternatives to methyl bromide. ARS also provides a representative to the Montreal Protocol Methyl Bromide Technical Options Committee which does assessments of the availability and efficacy of methyl bromide alternatives and provides technical advice to the Montreal Protocol on methyl bromide alternatives issues.

In fiscal year 2000 and fiscal year 2001, ARS will continue to conduct research on chemical, new application technology, and non-chemical alternatives to methyl bromide so that growers and other methyl bromide users will have effective, practical and economical replacements for methyl bromide when it is banned in 2005. To insure that its methyl bromide alternative research program is properly focused, ARS held two research review and planning meetings last year, one in Florida and one in California. Attendees included growers, postharvest methyl bromide users, Federal and university scientists, environmental regulatory officials, commodity representatives and State agricultural officials. Results of those meetings form the basis for the ARS program over the next 2 years.

Secretary Glickman has released $800,000 from Commodity Credit Corporation funds for a research package in fiscal year 2000 involving ARS IR-4, and university scientists to evaluate propargyl bromide for strawberries, tomatoes, peppers, ornaments, and other methyl bromide-impacted crops. Propargyl bromide is, arguably, the most promising methyl bromide alternative. It has greater activity than methyl bromide, and farmers would be able to use it in exactly the same way they presently use methyl bromide.

A company has recently expressed interest in registering propargyl bromide and the USDA will work to facilitate registration. Similarly, the USDA scientists are working to provide efficacy data to assist in registering methyl isdide, another methyl bromide alternative. A USDA priority is forging partnerships with registrants and potential registrants to get technically feasible alternatives through the regulatory process.

ARS effects technology transfer in several ways. It spends almost $500,000 each year to support demonstration tests of the most promising alternatives in grower fields in California and Florida. These tests are run cooperatively with university collaborators and are conducted using normal farming practices. ARS holds numerous meetings with growers and other methyl bromide users to discuss alternatives available for particular crops. The USDA publishes a quarterly Methyl Bromide Newsletter to provide rapid dissemination of the most recent research findings on alternatives. And as previously mentioned, the USDA works closely with U.S. Environmental Protection Agency and pesticide registrants to resolve regulatory issues that prevent the widest availability of promising alternatives to methyl bromide users.

The following are selected accomplishments for fiscal year 1999 research into alternatives for methyl bromide postharvest and preplant uses.

Preplant Soil Fumigation Alternatives

Research by ARS scientists located in Fresno, CA showed that parasitic nematodes for grape replants were controlled by Methyl iodide and Telone/Vapam. Methyl bromide is currently used to fumigate soil before replanting grapes and other perennial crops to control nematodes and other soil-dwelling plant pest organisms that cause replant disease. However, they also showed that fallow and fallow with cover crops, procedures that have been suggested as methyl bromide alternatives, were ineffective in control of these replant disease-causing organisms.

A team comprised of scientists from the ARS facility in Tifton, Georgia and the University of Georgia demonstrated that Telone + chloropicrin chisel injected + metam sodium under plastic film mulch and drip irrigation effectively controlled root-knot nematodes and soil-borne diseases on squash and cucumbers. Similar treatments, plus the integration of a root-knot nematode-resistant bell pepper cultivar (developed and released by the ARS Vegetable Laboratory in Charleston, South Carolina), indicate that this is a promising alternative to methyl bromide for peppers as well.

An ARS scientist at Beltsville, Maryland, conducted laboratory and greenhouse experiments with several proprietary natural product formulations in soil systems infested with two major pathogens, Fusarium oxysporum and Phytophthora nicotianae, and showed that several of the formulations were efficacious in reducing populations of test pathogens to levels below detection. In addition, seed or seedlings planted into the treated soils grew with little or no disease expression, suggesting that botanical formulations, alone or in combination with other components, may serve to replace preplant methyl bromide fumigation.

A gene that plays a role in suppression of damping-off disease of cucumber was determined by ARS scientists in Beltsville, Maryland, to be important in the colonization of plants by beneficial biocontrol agents. Identification of this gene will help in understanding the process of root colonization and disease suppression, important to the use of biocontrol agents as methyl bromide alternatives.

Isolates of the biocontrol bacterium Burkholderia cepacia and the fungus Gliocladium virens were evaluated by ARS scientists in Beltsville, Maryland, for suppression of the nematode Meloidigyne incognita on peppers and on tomatoes. It was found that certain isolates of B. cepacia and G. virens have potential as biocontrol agents for control of this important pathogenic nematode which is currently controlled by preplant soil fumigation with methyl bromide.

In ARS-sponsored research, a University of California scientist showed that chloropicrin and a combination of chloropicrin and Telone were as effective as methyl bromide in controlling the important pathogen Verticillium wilt in California strawberry nurseries. Cover crop treatments of rye or rye and mustard were, however, ineffective. Although Verticillium is one of the most important pests of strawberry nursery production, development of treatments to cover the entire spectrum of strawberry pests in nurseries is critical to the profitable production of strawberries in California. This treatment is accepted by California for nursery certification of strawberry plants but is presently limited by availability of Telone under California county restrictions.

Postharvest Commodity Treatment (Including Structural)

Research by ARS scientists in Fresno, California has demonstrated that sulfuryl fluoride can replace methyl bromide as a fumigant to kill codling moth and navel orange worm for walnuts being exported to Europe. Methyl

bromide fumigation is currently a requirement for entry into Europe because of possible presence of these pests. Sulfuryl fluoride is not currently registered for this use but these research results may provide an incentive to the maker of sulfuryl floride to register this material for use on walnuts and potentially could have a major impact on U.S. walnut growers by keeping open the lucrative European market after the loss of methyl bromide.

Dried fruit and nut processors currently rely on the fumigants methyl bromide and phosphine to disinfest their product of postharvest insects. ARS scientists in Fresno, California, showed that cold treatment is also effective as a disinfestation treatment for Indian meal moth eggs. Cold treatment may be a practical way to disinfest relatively uninfested commodities when used in an integrated pest management system and may effectively replace methyl bromide fumigation in some circumstances.

ARS scientists in Hilo, Hawaii, demonstrated that harvest-ready green bananas were not hosts for fruit flies, and they developed a protocol that allows export of bananas to the U.S. mainland, Guam, and Japan without methyl bromide fumigation or any other postharvest disinfestation treatment. Developments of strategies that open or increase export markets for Hawaii-grown products is critical to Hawaii's initiative to diversify agriculture to replace the sugar and pineapple industries, which are on the decline.

Mexico requires a 90-day cold storage at 3.3° C as a treatment against apple maggot and oriental fruit moth in apples as an alternative to methyl bromide. An ARS scientist in Weslaco, Texas, showed that reducing the temperature of the treatment from 3.3° C to 1.1° C, consistent with present commercial temperatures in cold storage facilities, significantly shortens the time required to get complete control of both pests. Treatment time could be reduced by more than 50 percent, thereby providing earlier access to the lucrative Mexico market each year after harvest.

A 2-year study by ARS scientists in Fresno, California, showed that granulosis virus persisted on stored nuts for at least 2 years and gave good levels of Indian meal moth mortality. These findings could result in long-term insect protection and reduce the need for methyl bromide and other chemical fumigants.

Research conducted by ARS scientists in Weslaco, Texas, proved that Spinosid was as effective as malathion in killing fruit flies when combined with an attractive bait. Spinosid was registered by the U.S. Environmental Protection Agency for this use. Effective eradication technology is critical, with the regulation of methyl bromide to lessen the impacts of exotic pest quarantines of domestically produced commodities.

MUSHROOM RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing in connection with mushroom research, by location, including your 1999 accomplishments and plans for fiscal year 2000.

Response: ARS conducted a limited amount of research on improving mushroom quality at the Eastern Regional Research Center (ERRC) in Wyndmoor, Pennsylvania. A washing process was developed that not only cleans mushrooms but also greatly extends shelf-life beyond that obtained with conventional washing. This technology was transferred to corporate partners in 1999. No mushroom research is planned for 2000.

Mr. Skeen: By location, what is the funding and staff for mushroom research for fiscal years 1999, 2000, and 2001?

Response: For fiscal year 1999 funding for mushroom research at Wyndmoor, Pennsylvania, was $176,40, and $0 in fiscal years 2000 and 2001. Staff for mushroom-related research was 0.5 of a scientist year for 1999.

Mr. Skeen: For the record, please provide the Committee with the names of corporate partners with ARS in mushroom research and some recent success stories.

Response: Mushroom research at ERRC was closely coordinated with the industry through a succession of cooperative agreements with 5 major U.S. producers. These included Country Fresh Mushrooms, Avondale, PA; Vlasic, Blandon, PA; Quincy Mushroom, Quincy, FL; Franklin Mushroom, Franklin, CT; and J.M. Mushroom, Miami, OK. Under these agreements, the mushroom industry funded research associates at ERRC, contributed corporate resources to the program, and participated in annual workshops to review research progress and plan future research directions. A scaled-up, continuous washing system was evaluated by ARS scientists and their industry collaborators in a commercial mushroom packing plant for technical and economic feasibility.

NARCOTICS CONTROL RESEARCH

Mr. Skeen: Please update the Committee on the work you have underway on narcotics control research, specifically 1999 accomplishments and plans for fiscal years 2000 and 2001.

Response: The program involves the evaluation of herbicidal and biological control agents for illicit narcotic plants, the estimation of illicit narcotic plant cultivation worldwide, narcotic plant chemistry and the development of alternative crops in narcotics impacted areas in the Western Hemisphere. In fiscal year 1999 ARS provided data from laboratory and field trials of potential biological control agents of coca and opium to the United Nations Drug Control Program. Improved delivery systems involving the use of surfactants and spray boom technology were applied to herbicidal eradication of illicit coca in Colombia. Field trials and workshops on the remote detection of illicit cannabis were conducted with U.S. law enforcement agencies, specifically the Drug Enforcement Administration, the Florida Department of Law Enforcement and the Maryland State Police. In an agreement between the Government of Peru, the Organization of American States, the Department of State and ARS, large scale field trials of control agents for diseases of cocoa, an important sustainable cash crop for small farmers in South America, were conducted in areas East of the Andes. Collaborative joint research efforts in cooperation with the Government of Colombia to control coffee pests have been formalized and are currently underway.

Mr. Skeen: Please provide a summary of funding ARS receives from others for this research in fiscal years 1999, 2000, and 2001.

Response: Fiscal year 1999 was highly unusual due to the impact of narcotic research funds appropriated in the Emergency Supplemental for Drug Trafficking in the Western Hemisphere. Although the funds were appropriated to the Department of State, some were provided by that department to ARS to support mutually agreed activities including small farmer support in Peru, coffee pest research in Colombia, and opium estimation projects in Asia. Funds received from the Department of State amounted to $6.45 million. Funds provided by the Office of National Drug Control Policy amounted to $4.5 million. Additionally, a cooperative research and development agreement was reached with M&M Mars, Inc. to jointly develop integrated pest management strategies for diseases in cocoa plantations in the Western Hemisphere. The value of this agreement amounts to approximately $100,000 annually. We cannot estimate the reimbursements in fiscal years 2000 and 2001 due to the pending

Colombian assistance package now being considered by Congress. We do understand, however, that ARS will receive funding to support research for the coffee industry in Colombia, as well as the introduction of new crops in that country.

Mr. Skeen: By location, what is the funding and staff for narcotics research in fiscal years 1999, 2000 and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Beltsville, MD	$3,548,400	8.9	$3,548,400	8.9	$3,548,400	8.9
Headquarters	1,750,600	--	1,216,600	--	1,216,600	--
Total	5,299,000	8.9	4,765,000	8.9	4,765,000	8.9

NATIONAL ARBORETUM

Mr. Skeen: Please provide for the record the budget for the National Arboretum for fiscal years 1999, 2000, and 2001.

Response: The budget for the National Arboretum for fiscal year 1999 was $8,623,900; for fiscal year 2000 $8,143,800; and for fiscal year 2001 $8,431,800.

Mr. Skeen: Please describe in some detail the current status of architectural and engineering efforts related to the construction of a new entrance to the National Arboretum, which we funded in last year's bill.

Response: The Arboretum's Master Plan is currently being developed and the 95 percent submittal is due in April 2000. The Agency has initiated discussions with the District of Columbia to ensure that their project for the redesign of Bladensburg Road is coordinated with plans for the new entrance from that roadway. Once the Master Plan is finalized, the design process will be initiated for the new entrance and should be completed in the fourth quarter of fiscal year 2001.

Mr. Skeen: What sums could be obligated during fiscal year 2001 as an initial funding increment for the entrance road?

Response: The total cost for the new entrance is estimated between $3.5 and $4 million, dependent upon the extent of improvements to Bladensburg Road required by the District of Columbia. The agency will not be in a position to obligate any of these funds in fiscal year 2001 since design will not be completed until the fourth quarter of fiscal year 2001.

Mr. Skeen: The Committee is aware of problems at the National Arboretum related to Hickey Run. This small tributary of the Anacostia River drains approximately 700 acres of developed and paved urban land, and deposits petroleum and hydrocarbon pollution as well as trash and debris onto the Arboretum grounds. Please describe in some detail the cost and scope of remedial action that could be executed during fiscal year 2001.

Response: A storm water management conceptual design for Hickey Run was completed in October 1999 using $48,000 in Environmental Protection Agency and Agricultural Research Service funds. The study determined the underlying cause of water quality degradation in Hickey Run to be from sources upstream of the Arboretum and called for supporting the implementation of a pollution

abatement program for the Hickey Run watershed. The study also provided numerous recommendations to reduce the pollution entering the Arboretum by construction of trash racks to intercept trash and debris flowing into the Arboretum; installation of absorbent booms to intercept petroleum and hydrocarbon pollution; removing and replacing the concrete walls along Hickey Run between Hickey Lane and the sanitary sewer crossing; repairing the sanitary sewer where it crosses Hickey Run; inspection of the entire sewer line which crosses the Arboretum property; construction of two ponds on Hickey Run to control erosion of the stream banks, improve the aesthetics of the area, and provide an educational avenue for aquatic plant exhibits and collections; and stabilizing the tributaries which discharge into Hickey Run.

The estimated cost of the proposed work is $1.7 million. Of this amount, $525,000 could be utilized in fiscal year 2001 to conduct a geotechnical investigation, develop construction plans and specifications, and install the trash rack and oil booms.

NEW CROPS

Mr. Skeen: Please update the Committee on the research ARS did on new crops in fiscal year 1999, including any research products that are likely to be available for American agriculture in the near future.

Response: The ARS new crops research is focused on those new or alternative crops that are compatible with environmental concerns, that contribute to sustainable production systems, and that provide potential for domestically processed value-added products or strategic materials. Most are oil-bearing seed crops useful in industry or as replacements for imports.
[The information follows:]

Cuphea--*Cuphea viscosissima* is native to the temperate regions of the U.S. and contains medium chain oils. *Cuphea* oil has the potential to replace oils that are now imported, such as coconut and palm oils from tropical regions for use in detergents and other industrial products. For *Cuphea* to become a domestic crop, the wild seed needs to be domesticated by changing several of the wild seed's characteristics--like the tendency to scatter its seed before harvest and to require a dormant period before it sprouts. Cuphea varieties were successfully grown in central Illinois in 1999.

Vernonia--*Vernonia galamensis* is native to Africa, but has been bred to grow in shorter day-length regions. Vernonia oil (epoxy oil) has the potential to replace solvents in paints and become part of the finished coating, which reduces air pollution from solvents. The domestication and commercialization of vernonia depends on development of high yielding cultivars and development of reliable agronomic practices.

Hevea--*Hevea braziliensis* is the natural rubber tree which is the source of the U.S.'s imported natural rubber. There is research to determine the biochemical pathway and enzymes responsible for production of natural rubber in *Hevea* for incorporation into other plants, such as guayule, but there is no research in ARS to domestically develop *Hevea* as a new crop in the U.S.

Lesquerella--*Lesquerella fendleri* is a winter annual that can be grown in the Southern U.S. for its oil, gum, and meal. There is a large potential market. Barriers to commercialization are the low oil content, lack of self-pollinating seed, limited reliable cultural practices, and lack of seed harvesting and cleaning equipment. New self-pollinating lesquerella varieties have been developed and other varieties with a higher lesquerolic acid in the seed.

Meadowfoam--*Limnanthes alba* is being commercially grown in Oregon, and it can be grown in other regions of the U.S. as well. Meadowfoam oil, which has long chains and is very stable in air, has been modified chemically to develop potential new products for the personal care, lubricants, and detergent industries, while the seed meal may have application as a natural preemerge herbicide and nematocide. The market for meadowfoam products is developing rapidly, but seed varieties that are self-pollinating and consistently high yielding for many regions of the U.S. are needed.

Crambe--*Crambe abyssinica* is grown commercially on 30,000 acres in North Dakota. New markets for the oil and meal need to be found to ensure crambe's potential as a significant crop for the Northern tier of states in the U.S.

Guayule--*Parthenium argentatum* is a desert shrub that has been grown in Arizona, California, and Texas. Guayule produces natural rubber that has potential markets in hypo-allergenic surgical gloves and a resin that has potential in paints and coatings. Two patents have been issued and licensed by a private entrepreneur. Continued development of the fledgling guayule industry in areas such as agronomy and processing are needed to bring guayule to commercialization.

Jojoba--*Simmondsia chinensis* is a perennial shrub being commercially grown in the desert Southwest for its unique oil. About 2 million pounds of seed were harvested in 1999. The oil has markets in lubricants and personal care items and 70% of U.S. production is exported to Japan and Europe but much larger acreage would be economically feasible if coproducts were developed to support high farm-gate value, even when oil prices are low. The seed meal was being discarded, but now new markets are being explored and development of the processing of the meal and its commercial uses need to be supported.

Kenaf--*Hibiscus cannibinus* is an annual fiber crop grown on 6,000 acres in the Southern U.S.in 1999 for a number of specialty fiber applications. Fiber separation facilities are in Texas, Mississippi, and Louisiana. New uses for core kenaf are coming on line.

Mr. Skeen: What was spent on these new crops in fiscal year 1999, what is planned for fiscal years 2000 and 2001?

[The information follows:]

Crop	FY 1999 Estimated	FY 2000 Estimated	FY 2001 Estimated
Canola	$145,000	$139,000	$139,000
Crambe	113,000	115,000	115,000
Cuphea	432,000	465,000	817,000
Guayule	558,000	552,000	952,000
Jojoba	155,000	170,000	142,000
Kenaf	728,000	519,000	250,000
Lesquerella	363,000	369,000	321,000
Meadowfoam	501,000	463,000	386,000
Safflower	59,000	124,000	60,000
Vernonia	151,000	155,000	155,000
Total:	$3,205,000	$3,071,000	$3,337,000

PEANUT RESEARCH

Mr. Skeen: Please update the Committee on the work you have underway on peanut research, including 1999 accomplishments and plans for fiscal year

2000.

Response: ARS has peanut research underway at ten locations. This research contributes to these general goals: reduce peanut production, processing, and handling costs; improve peanut safety by reducing aflatoxin contamination and the allergen potential. Accomplishments in 1999 include taking the lead in managing the National Plant Germplasm Storage system whereby more than 8,000 peanut lines are stored at Griffin, Georgia, with backup storage at Fort Collins, Colorado. These lines are the source of new genes for developing new peanut varieties with improved resistance to pests and for other improvement in peanuts. ARS scientists at the National Peanut Research Laboratory in Dawson, Georgia, have developed expert systems that serve as decision-support systems to help growers and processors make more informed decisions on irrigation, harvesting, handling, and farm management. Scientists at the National Peanut Research Laboratory have also discovered benign strains of molds that can be used to greatly limit aflatoxin contamination of peanuts.

ARS scientists at Tifton, Georgia, have identified peanut lines that show resistance to preharvest aflatoxin contamination and have developed improved methods for weed control in peanuts. Scientists at Raleigh, North Carolina, have identified improved methods for more accurately sampling peanut lots to determine the level of aflatoxin contamination. ARS scientists at Stillwater, Oklahoma, worked with scientists at Texas A&M University to develop improved peanut varieties with resistance to *Sclerotinia*, an important disease in peanuts.

Research plans for fiscal year 2000 are listed by location:
[The information follows:]

Albany, CA - Continue work to develop a sorter to remove undesirable peanuts, such as those contaminated with aflatoxin.

Fort Collins, CO - Continue to maintain the backup collection of peanut germplasm in long-term storage.

Gainesville, FL - Conduct research in support of the development of integrated pest management procedures for control of stored-product insects.

Dawson, GA - Conduct research to develop improved production, handling, and storage systems; improve techniques for biocontrol of aflatoxin contamination of peanuts; improve expert systems to better manage peanut production and handling; and develop improved irrigation systems for peanut production and to make efficient use of irrigation water.

Griffin, GA - Continue to maintain the peanut germplasm collection and add to the collection as new germplasm becomes available, continue to evaluate the germplasm in the collection for desirable traits, and distribute seed to plant breeders as requested.

Tifton, GA - Continue research to develop improved management practices for controlling insects, nematodes, and weeds; and develop germplasm and breeding lines of peanuts with resistance to diseases, insects, nematodes, and preharvest aflatoxin contamination.

New Orleans, LA - Conduct research that will lead to development of adsorbent by-products for peanut shells and to determine the effects of roasting peanuts on development of allergens.

Raleigh, NC - Conduct research to determine the impact of genetic resources, maturity, and handling on flavor components; develop a better understanding of the biochemical factors that determine variation in flavor components; devise techniques for evaluating peanut quality based on small samples; and to develop sampling techniques to accurately measure quality constituents of peanuts.

Stillwater, OK - Conduct research to identify the mechanisms of resistance to disease in peanuts, evaluate peanut germplasm for disease resistance, and develop transgenic peanut germplasm with resistance to important peanut pathogens.

Lubbock, TX - Conduct research that will lead to a better understanding of the impact of high temperature and water stress on peanuts and to develop ways to reduce the negative effects of these stresses.

Mr. Skeen: By location, what is the funding and staff for peanut research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Albany, CA	--	--	$131,500	0.4	$131,500	0.4
Ft. Collins, CO	$136,400	0.5	151,800	0.4	151,800	0.4
Gainesville, FL	277,300	1.0	283,100	1.0	283,100	1.0
Dawson, GA	3,029,300	8.0	3,746,500	9.0	2,582,300	8.0
Griffin, GA	336,600	1.2	342,800	1.0	447,800	1.0
Tifton, GA	857,500	2.3	937,900	2.7	937,900	2.7
New Orleans, LA	838,300	3.2	855,500	3.4	855,500	3.4
Raleigh, NC	868,800	3.6	1,075,500	3.7	600,000	1.7
Stillwater, OK	468,900	1.3	478,800	2.1	478,800	2.1
Lubbock, TX	--	--	164,100	0.4	164,100	0.4
Headquarters	215,300	--	217,900	--	217,900	--
Totals	7,028,400	21.1	8,385,400	24.1	6,850,700	21.1

PEAS, LENTILS, AND LEGUMES

Mr. Skeen: Please update the Committee on the work you have underway on peas, lentils, and legumes, including 1999 accomplishments and plans for fiscal year 2000.

Response: ARS conducts research on peas, lentils, and legumes at twelve locations. The objectives of this research by location will be provided for the record. The program is a nationally managed, fully coordinated, multi-disciplinary approach to solving production and postharvest issues of peas, lentils, and legumes.

[The information follows:]

Miami, FL - Development of methodology for detection and control of foreign plant pests which may enter the U.S. from the Caribbean, Central and South America. In 2000, research will focus on determination of the life history and behavior of potential predators that can be used in development of control strategies.

Griffin, GA--Detection and elimination of viruses in legume germplasm; detection of resistance to viruses in legume germplasm. In 1999, Vigna and legume germplasm accessions curated at the germplasm repository were further characterized for resistance to economically important viruses. This work will be continued in 2000.

Tifton, GA--Determine the magnitude of the residues of crop protection compounds in food crops in support of registration/reregistration of IR-4 Minor Use chemicals. In 1999 and 2000, the IR-4 field and laboratory projects continued their mission in cooperation with a network of state and federal cooperators that generates data from "magnitude of residue" field studies of pesticides on minor crops. The data generated is used to support petitions submitted to EPA for the registration/reregistration of those chemicals for

control of specific pests.

Beltsville, MD - Development of biocontrol strategies for control of soil-borne pathogens. In 2000, research will examine the impact of the soil environment on expression of biocontrol traits.

Frederick, MD--Develop improved methods of detection and identification of disease agents and characterize exotic pathogens of quarantine significance. In 1999, efforts continued to develop more rapid, reliable assays to facilitate movement of germplasm into breeders programs in a more expeditious manner. These efforts will continue in 2000.

Fargo, ND--Characterization of internal chemistry of whitefly to determine their roles in predator/prey recognition and predator nutrition; identify and characterize genes controlling insect development. In 1999, a DNA probe was identified which could distinguish different wasp species which parasitize whitefly. In 2000, the cuticular lipids of the whitefly predator, Semidalis flinti, will be identified and the lipid-producing structures characterized by scanning electron microscopy to compare with those of its prey.

Lane, OK - Development of control strategies for insect pests of vegetables; development of vegetable production systems to control weeds. In 2000, production system research will be conducted to determine the most effective allelopathic winter cover crop to reduce weed germination and production in vegetable crops.

Pendleton, OR--Evaluation of tillage systems on residue placement and decomposition in relation to soil erosion. In 1999, scientists established that water infiltration and earthworm populations can be expected to increase significantly under no-till conditions. In 2000, ARS will make measurements in the long-term no-till experiments to provide a database for documenting soil and crop changes when converting from conventional to no-till management.

Charleston, SC--Development of legumes with improved quality and increased resistance to nematodes and other soilborne pathogens; determination of alleopathic factors affecting weed control. In 1999, ARS released Green Pixie southernpea, a southernpea cultivar with a persistent green seed color to replace the popular cultivar White Acre. In 2000, ARS will release a green cotyledon, blackeye-type southernpea cultivar with excellent yield potential. The new cultivar will be the first green cotyledon, blackeye-type cultivar made available to U.S. growers.

Prosser, WA--Evaluation and enhancement of pea germplasm and identification of disease resistance. In 1999, ten multiple disease resistant pea lines were released. In 2000, additional pea lines with enhanced quality and disease resistance will be released. A combination fungicide/biocontrol strategy to control pea root rot will be completed.

Pullman, WA--Identification of insect and disease resistance in dry peas and lentils; establishment of genetic linkage maps in lentils, dry peas, and chickpeas; development of improved varieties; development of integrated pest management systems; and maintenance of pea germplasm and pea genetic stocks. In 1999, genes for increased biomass were incorporated into pea and lentils and plant architecture was altered to improve suitability for mechanical harvest. In 2000, chickpea lines with resistance to blight and with Spanish White type quality will be released.

Headquarters--Review and evaluate research proposals from ARS scientists and Crop Germplasm Committees.

Mr. Skeen: By location, what is the funding and staff for peas, lentils, and legumes research for fiscal years 1999, 2000 and 2001?

[The information follows:]

Location	FY 1999 Funds	FY 1999 SYs	FY 2000 Funds	FY 2000 SYs	FY 2001 Funds	FY 2001 SYs
Miami, FL	--	--	$124,200	--	$124,200	--
Griffin, GA	$442,800	1.2	451,000	1.2	451,000	1.2
Tifton, GA	75,300	0.1	76,200	0.1	76,200	0.1
Beltsville, MD	--	--	55,400	0.2	55,400	0.2
Frederick, MD	29,900	0.1	30,500	0.1	30,500	0.1
Fargo, ND	82,300	0.3	83,900	0.2	83,900	0.2
Lane, OK	--	--	56,200	0.2	56,200	0.2
Pendleton, OR	86,000	0.3	87,800	0.3	87,800	0.3
Charleston, SC	288,800	1.1	294,800	1.1	294,800	1.1
Prosser, WA	270,100	1.0	275,700	1.0	275,700	1.0
Pullman, WA	796,200	2.7	836,700	2.7	685,700	2.7
Headquarters	62,900	--	63,600	--	63,600	--
Total	2,134,300	6.8	2,436,000	7.1	2,285,000	7.1

PECAN RESEARCH

Mr.Skeen: Please describe for the Committee the work you are doing in connection with pecan research, by location, including 1999 accomplishments and plans for fiscal year 2000.

[The information follows:]

Byron, GA--Germplasm enhancement; and development of improved pecan cultivation and pest (disease and insect) management strategies. Improved integrated pest management practices were developed in 1999 to better control pest induced alternate bearing. In 2000, research will be continued to develop improved management strategies to reduce fruit drop and alternate bearing and to control pecan scab.

New Orleans, LA--Development of technologies to assist commodity processors (nut shellers) in converting their by-products to value-added adsorbents. In 1999, researchers demonstrated that nut shells may be superior metal adsorbents for use in waste water treatment applications. In 2000, researchers hope to develop a CRADA to further develop and transfer this technology.

Stoneville, MS--Development of biological and other non-insecticidal methods to manage insect pests of pecan. In 1999, integrated pest management strategies to control stink bugs were investigated and the results transferred to Byron, GA. Pecan research was phased out in 2000 at Stoneville and insect control efforts focused at Byron, GA.

College Station, TX--Pecan genetics, breeding and germplasm maintenance. 'Hopi', a new pecan cultivar valued for its superior nut production, was released in 1999. Breeding efforts will be continued in 2000 with an emphasis on nut production and quality and improved disease resistance.

Mr. Skeen: By location, what is the funding and staff for pecan research for fiscal years 1999, 2000, and 2001?

Response: The funding and staff for pecan research by location will be provided for the record:

[The information follows:]

Location	FY 1999 Funds	FY 1999 SYs	FY 2000 Funds	FY 2000 SYs	FY 2001 Funds	FY 2001 SYs
Byron, GA	$1,515,600	2.5	$1,543,100	3.5	$1,543,100	3.5
New Orleans, LA	33,900	0.1	34,700	0.1	34,700	0.1
Stoneville, MS	239,000	0.4	--	--	--	--
College Sta., TX	547,400	1.9	557,300	1.9	607,300	1.9
Total	2,335,900	4.9	2,135,100	5.5	2,185,100	5.5

PHYTOESTROGEN RESEARCH

Mr. Skeen: Please update the Committee on the research being conducted on phytoestrogen, or compounds in plant foods that are metabolized by the human body to resemble naturally occurring estrogens.

Response: Phytoestrogens are compounds in plant foods that are metabolized by the human body to resemble naturally occurring estrogens and may retard some of the adverse metabolic effects of estrogen. Phytoestrogens are derived from two subclasses of compounds, isoflavones and lignans. Isoflavones which are supplied primarily by soybeans and soy-containing foods, have been well characterized and can be measured with modern analytical techniques. Lignans, however, are widely distributed in the food supply, are less well characterized and the current analysis is long and laborious.

Scientists at the Food Composition Laboratory, Beltsville Human Nutrition Research Center, are characterizing lignans in foods that have high concentrations of these phytonutrients, such as flax-and rye-containing foods as well as several vegetables. In addition, these scientists also are developing analytical procedures that are streamlined and accurate for the determination of lignans in foods. The newly developed techniques will be applied to the measurement of phytoestrogens in commonly consumed U.S. foods. These data will be incorporated into the USDA National Nutrient Data Bank and will form the basis of a database of phytoestrogen values which can be used by health scientists to assess the role of these phytonutrients in the promotion of health and the delay of degenerative processes.

The phytoestrogen research at the Southern Regional Research Center in New Orleans, LA, involves extensive cooperation with Tulane University. This project will develop practical methods to elicit desired phytoestrogen compounds in soybean seed for maximum health effects and will hyper-induce production of potentially new phytoestrogenic compounds in order to characterize microbial interactions and components which influence biosynthesis of these isoflavones in soybean. Secondly, both microbial and animal system bioassays will be conducted to determine the potency and mechanisms of action of phytoestrogens using cell bioassays, estrogen receptor binding assays and eventually animal feeding trials. Based on this information, specific isoflavone pathways in soybean which lead to synthesis of compounds with optimal phytoestrogen activities in animal systems will be identified and optimized using genetic engineering where necessary.

The Arkansas Children's Nutrition Center (ACNC) in Little Rock, AR, has a role in learning how early nutrition and nutritional intervention will affect the long-term health consequences of children. This Center currently focuses on dietary factors in the diets of infants and children as they grow to adults. There are hundreds of substances in the diet other than the typical nutrients such as vitamins, minerals, etc. Research at ACNC has shown that phytoestrogens in soybeans will prevent breast cancer in animal models. This is important because 20-25 percent of infants in the USA are fed soy-based infant formulas that are extremely high in many compounds. ACNC researchers are developing methods to determine how soy phytoestrogens would have protective effects against cancers.

Mr. Skeen: By location, what is the funding and staff for phytoestrogen research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location	FY 1999	FY 2000	FY 2001
Little Rock,AR	$1,498,600	$819,700	$1,619,700
New Orleans, LA	343,700	448,700	448,700
Beltsville, MD	543,800	374,800	470,800
Total	2,386,100	1,643,200	2,539,200

PLANT GENE EXPRESSION CENTER

Mr. Skeen: Please describe for the Committee some of the accomplishments of the Plant Gene Expression Center during the past 12 months.

Response: During 1999, the Plant Gene Expression Center (PGEC) made significant progress in identifying, isolating, and characterizing important genes and learning how they encode agriculturally-important features in crops. The following accomplishments were attained, many of them in close collaboration with university cooperators, and with industrial partners through Cooperative Research and Development Agreements(CRADAs):

Genome sequencing: The PGEC is part of a consortium that is producing the first complete sequence of a plant's (Arabidopsis, a convenient model plant for genetic studies) genetic material. This project is years ahead of schedule, and will be complete by the end of 2000. PGEC scientists have now determined the sequence of 6.1 million DNA base pairs. Many of the genes found in Arabidopsis have never been identified before. The sequence information is provided to the public and updated weekly on the WorldWide Web at http://pgec-genome.pw.usda.gov. This pioneering effort is extremely valuable because it helps establish methods for use on the larger, more complicated, genomes of crop plants; it reveals important clues to the organization and control of genes and their relationship to each other; and it provides a central databank so that biologists everywhere can identify genes with similar sequences, and their functions, in other organisms.

Heavy metal detoxification by plants: Toxic metals are persistent environmental pollutants. Even low rates of accumulation over time lead to toxic accumulation. Engineering nonfood plants to mine heavy metals from contaminated sites offers an economically feasible solution for remediation. Plants, however, generally have a low tolerance for these toxins. Through a new technique that involves special genetic strains of yeast, PGEC scientists identified genes that confer enhanced tolerance to toxic heavy metals. Several of these genes were inserted into the genetic materials of the model plant Arabidopsis. These transgenic plants, more resistant to heavy metals and oxidizing agents than are "normal plants," represent the first step in producing special plant varieties that can remove toxic heavy metal from the environment.

Site-specific recombination: DNA recombination joins segments of one DNA molecule with other. Often, this recombination process operates on such segments indiscriminantly, i.e., without regard to DNA sequence. As a result, conventional genetic engineering methods may insert segments at random locations in the plant genome. In contrast, the recombination systems of certain viruses that can direct the sequence-specific recombination of DNA, where the virus inserts its genetic material site-specifically into a defined chromosome target. PGEC scientists have shown that one such site-specific

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recombination system can function in cells like those of plants and animals. This system differs from older systems in that the recombination reaction is not reversible: what is inserted will not "pop out" unexpectedly, making the system ideal for site-specific insertion of DNA. A provisional patent was filed for this new technique and licenses were granted to an animal biotech firm in California and a plant biotech company in New Jersey.

Cotton gossypol: Cottonseed, a major byproduct of the cotton plant, is rich in protein and oil. However, few animals can thrive on cottonseed due to the presence of gossypol, a toxic compound found throughout the plant, that helps prevent insect infestation. For the production of cottonseed oil, the cottonseed must be chemically treated to remove gossypol. If gossypol were not present, cottonseed oil could be made more economically. In addition, it would open new feed markets for cottonseed meal for animals such as chickens, pigs, and fish. To realize this goal, PGEC scientists isolated a gene for a protein that degrades gossypol, and introduced it into cotton. The transgenic cotton leaves show fewer gossypol glands. To obtain truly gossypol-free cottonseed, the scientists must confine the gene's expression specifically to the cotton seed.

Plant response to light: PGEC researchers have recently discovered that the same molecule that absorbs light to tell a plant what time of day it is, and whether it is in sun or shade, also may regulate how and when genes function. Knowledge of how plants communicate cues from the environment may be key to precisely controlling crop plant flowering, fruiting and maturation.

Corn inbred lines: Different inbred lines are combined to make hybrid vigor in corn. The genetic differences between inbreds are thought to be vast and difficult to determine precisely. PGEC researchers found that one important difference between some inbred lines is the size of the meristem, a patch of actively dividing cells, in the embryo. Inbred lines with a larger meristem survive in the absence of a substance that partially controls cell division, whereas inbred lines with a smaller meristem fail to grow. It appears that a single gene is responsible for this difference among inbred lines. This information may prove useful for corn breeders who are making new hybrid varieties.

Late blight disease of potato: Potato, a crop of worldwide importance, is one of the most important human foods. The late blight disease, caused by a fungus, is the most serious threat to potato production worldwide. Fungicide-resistant fungi recently evolved, thus intensifying the urgent need to develop a new kind of crop resistance to this microbe. However, breeding cultivated potato for a single disease resistance trait can take 10-20 years and pathogens rapidly evolve to overcome single resistance traits. PGEC scientists found that the genetic material of wild potato includes dense concentrations of genes that confer resistance to several different pathogens. This genetic material may provide a critical foundation for developing new, durable, broad spectrum resistance to late blight. Additionally, combinations of several genes derived from wild species will be fundamental for developing new crop protection strategies against late blight. Isolating those genes from wild potatoes will enable isolation of similar genes, and possibly reveal the molecular basis of the durable resistance. The successful transfer of late blight resistance genes from wild potato to cultivated potato should produce resistant cultivars, thereby reducing both the monetary cost and the environmental impact of potato production by eliminating or reducing the need for chemical controls for late blight disease.

Mr. Skeen: What is the budget for the Center for fiscal years 1999, 2000, and 2001?

Response: The budget for the PGEC for fiscal year 1999 was $3,572,700, for fiscal year 2000 $3,578,800, and for fiscal year 2001 $3,478,700.

POTATO RESEARCH

Mr. Skeen: In table format, please provide the Committee with a brief summary of the work you are doing in connection with potato research, by location.

Response: A description of ARS potato research programs by location will be provided for the record. The program is a nationally managed, fully coordinated, multi disciplinary approach to solving production and postharvest issues of potatoes.

[The information follows:]

ARS Headquarters	Funds maintained at headquarters are allocated for extramural research on ring rot, early dying, and scab disease problems, aphid and beetle control, marketing, and variety development.
Albany, CA (Plant Gene Expression Center)	Development of new genetic engineering techniques and gene expression of economically important genes in potato.
Albany, CA (Western Regional Research Center)	Improved potato quality using plant cell transformation and other genetic engineering techniques.
Newark, DE	Development of insect biocontrol strategies for controlling European corn borer.
Aberdeen, ID	Development of new improved pest resistant varieties and disease management strategies.
Peoria, IL	Determination of the chemical mode of action of potato sprout inhibitors.
Beltsville, MD	Germplasm evaluation, enhancement, and breeding improved varieties; protoplast fusion and other genetic engineering techniques; processing germplasm introductions; pathogen-host interactions and genetics of pest resistance; and biological control of potato insects. Field trials in support of the breeding program are conducted at Presque Isle, Maine.
Columbia, MO	Identify natural products to improve artificial diets of beneficial organisms used for biological control of insect pests.
Fargo, ND	Marketing, storage, and inhibition of sprouting. Physical properties and other factors associated with processed potato quality; volatiles and prediction of potato quality from bulk storage; processing quality factors of potatoes following storage; evaluation of potential new varieties for processing attributes; and inhibition of sprouting.
Frederick, MD	Characterization and genetics of new and exotic strains of fungal pathogens of potato, especially the potato late blight disease pathogen.

Ithaca, NY	Evaluation of potato germplasm for nematode resistance; biology and integrated management of the golden nematode based on host resistance, cultural practices, biological control, and soil fumigation. Control of potato disease and nematodes; development of integrated pest management strategies; and determination of soil and water stress effect on potato production.
Wyndmoor, PA	Biochemical nature of the interaction of potato pathogens with host plant; mycotoxin production in plants; and improved food processing methods for potatoes.
Prosser, WA	Evaluation and enhancement of potato germplasm, including use of genetic engineering techniques, development of new improved varieties, and methods of disease control.
Yakima, WA	Insect behavior; insect ecology; biological control; and improved non-pesticidal methods to control potato insects.
Madison, WI	Classification, evaluation, preservation, and distribution of introduced germplasm; potato genetics and cytogenetics; and protoplast fusion and other genetic engineering techniques.
Weslaco, TX	Biological control of sweetpotato whitefly and diamondback moth on vegetable crops.

Mr. Skeen: By location, what is the funding and staff for potato research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Albany, CA	$852,900	2.5	$869,100	2.5	$869,100	2.5
Newark, DE	--	--	33,300	0.1	33,300	0.1
Aberdeen, ID	530,100	2.0	539,900	2.0	539,900	2.0
Peoria, IL	323,800	1.0	322,200	0.8	322,200	0.8
Beltsville, MD	4,157,000	11.1	4,379,400	10.0	4,501,900	10.0
Frederick, MD	155,200	0.6	158,100	0.6	158,100	0.6
Columbia, MO	593,900	1.1	605,400	1.8	605,400	1.8
Fargo, ND	1,663,700	4.1	1,814,900	5.6	1,814,900	5.6
Ithaca, NY	1,228,200	3.6	1,629,600	3.3	1,310,400	3.3
Wyndmoor, PA	312,200	0.6	316,400	0.9	316,400	0.9
Weslaco, TX	567,300	2.0	124,400	0.4	124,400	0.4
Prosser, WA	1,077,100	3.4	1,355,900	3.1	1,241,100	3.1
Yakima, WA	817,000	2.1	835,800	2.1	835,800	2.1
Madison, WI	764,500	4.2	813,600	4.2	973,600	4.2
Headquarters	1,373,800	--	1,576,000	--	1,576,000	--
Total	14,476,700	38.3	15,374,000	37.4	15,222,500	37.4

Mr. Skeen: Please provide for the record a table showing the research funding devoted to ring rot, early dying, marketing, aphids, potato beetle, weeds, variety development, soils, and agricultural engineering for fiscal years 1999, 2000 and 2001.

Response: A table showing funding for potato research devoted to ring rot, early dying, marketing, aphids, potato beetle, weeds, variety development, soils, and agricultural engineering for fiscal years 1999, 2000 and 2001 will be provided for the record.

[The information follows:]

	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
Ring Rot	$252,700	$291,600	$291,600
Early Dying	172,900	199,500	199,500
Marketing	2,172,600	1,911,000	1,911,000
Aphids	317,700	390,800	390,800
Potato Beetle	3,767,900	3,801,500	3,801,500
Weeds	--	--	--
Variety Development	2,024,400	2,114,700	2,114,700
Soils	362,500	614,900	614,900
Agricultural Engineering	--	--	--
Total	9,070,700	9,324,000	9,324,000

LATE BLIGHT POTATO RESEARCH

Mr. Skeen: By location, what is the funding and staff for late blight potato research for fiscal years 1999, 2000 and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Aberdeen, ID	$53,000	0.2	$54,000	0.2	$54,000	0.2
Beltsville, MD	348,200	0.9	355,200	0.9	355,200	0.9
Frederick, MD	186,200	0.7	189,800	0.7	189,800	0.7
Ithaca, NY	257,400	0.9	313,600	0.7	260,800	0.7
Madison, WI	109,400	0.5	111,600	0.5	111,600	0.5
Total	954,200	3.2	1,024,200	3.0	971,400	3.0

SOIL AND WATER RESEARCH

Mr. Skeen: By location, what is the funding and staff associated with research laboratories working on soil and water research for fiscal years 1999, 2000, and 2001.

Response: The dollars and scientist staff years for soil and water research for fiscal years 1999, 2000, and 2001 will be provided for the record.

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Auburn, AL	$995,700	4.1	$1,020,100	3.6	$1,020,100	3.6
Booneville, AR	124,400	0.2	156,200	0.5	156,200	0.5
Fayetteville, AR	--	--	--	--	300,000	1.0
Phoenix, AZ	2,478,900	9.1	2,480,200	7.6	3,480,200	10.6
Tucson, AZ	1,742,000	5.9	1,888,700	5.9	2,188,700	5.9
Albany, CA	700,800	2.4	769,900	0.8	1,130,400	1.8
Parlier, CA	1,292,800	3.7	1,385,700	4.1	1,411,400	4.6
Riverside, CA	3,208,400	10.5	3,164,300	8.9	3,764,300	11.9
Salinas, CA	--	--	63,800	0.2	--	--
Ft. Collins, CO	3,761,800	12.2	3,907,900	10.9	4,207,900	11.9

Akron, CO	534,400	2.0	545,400	2.0	545,400	2.0
Brooksville, FL	--	--	182,900	0.4	182,900	0.4
Canal Point, FL	247,000	--	201,600	0.8	201,600	0.8
Ft. Lauderdale, FL	848,700	3.6	866,100	4.2	866,100	4.2
Gainesville, FL	214,300	1.0	218,900	0.8	218,900	0.8
Miami, FL	574,400	1.0	607,400	2.0	907,400	3.0
Athens, GA	2,193,100	8.0	2,484,900	8.0	2,574,900	9.0
Tifton, GA	2,353,700	7.2	2,403,900	7.0	2,703,900	8.0
Ames, IA	5,102,400	15.7	3,800,200	11.3	4,400,200	13.3
Boise, ID	1,455,700	6.8	1,486,000	5.8	1,786,000	6.8
Kimberly, ID	2,770,600	11.0	2,829,200	11.0	3,129,200	12.0
Peoria, IL	69,300	0.3	--	--	--	--
Urbana, IL	33,000	0.1	33,700	0.1	33,700	0.1
W. Lafayette, IN	1,903,200	6.4	1,938,600	6.5	1,938,600	6.5
Manhattan, KS	906,000	4.0	1,035,400	5.0	1,125,400	5.0
Baton Rouge, LA	859,300	3.1	877,200	3.4	1,177,200	4.4
Beltsville, MD	7,630,600	20.9	8,202,400	22.8	10,007,400	28.8
Morris, MN	913,400	3.2	1,082,100	3.3	1,082,100	3.3
St. Paul, MN	1,108,400	3.5	578,000	2.2	1,153,000	4.2
Columbia, MO	1,312,500	4.2	1,682,400	4.2	1,498,200	3.2
Miss. State, MS	286,200	0.6	426,000	1.6	426,000	1.6
Oxford, MS	5,331,000	14.6	5,888,300	14.6	5,725,000	14.0
Stoneville, MS	286,800	0.9	292,400	0.9	292,400	0.9
Sidney, MT	147,100	0.6	309,200	0.6	149,800	0.6
Mandan, ND	880,000	2.5	1,294,900	4.3	1,294,900	4.3
Lincoln, NE	1,841,900	5.6	1,837,400	6.7	2,137,400	7.7
Ithaca, NY	419,900	0.8	515,200	2.1	727,200	2.1
Columbus, OH	604,100	2.4	615,700	2.3	915,700	3.3
Coshocton, OH	820,600	3.1	839,800	3.1	1,139,800	4.1
El Reno, OK	1,835,300	6.4	2,216,500	5.6	2,516,500	6.6
Stillwater, OK	677,200	3.3	775,500	3.0	775,500	3.0
Corvallis, OR	--	--	172,100	0.7	172,100	0.7
Pendleton, OR	913,000	3.6	932,300	3.6	1,232,300	4.6
Univer. Park, PA	1,347,900	3.8	1,538,400	3.4	1,838,400	4.4
Wyndmoor, PA	76,100	0.3	77,500	0.3	77,500	0.3
Florence, SC	1,524,300	5.7	1,461,300	5.5	1,761,300	6.5
Brookings, SD	198,400	0.9	202,100	0.6	202,100	0.6
Bushland, TX	2,033,900	8.9	2,077,400	8.9	2,407,400	9.9
Lubbock, TX	1,280,600	3.5	1,388,200	3.4	1,303,200	3.4
Temple, TX	1,730,600	6.3	1,766,700	6.3	2,341,700	8.3
Weslaco, TX	999,000	2.8	1,018,400	2.4	1,018,400	2.4
Prosser, WA	296,400	1.6	377,800	0.7	301,300	0.7
Pullman, WA	1,110,800	4.4	1,132,400	4.3	1,162,400	4.3
Madison, WI	98,200	0.2	82,200	0.2	82,200	0.2
Beaver, WV	1,334,200	4.2	1,596,100	4.3	1,341,100	4.3
Cheyenne, WY	680,500	1.8	695,600	2.3	695,600	2.3
TOTAL	72,088,800	238.9	75,422,500	235.0	85,228,500	268.7

Mr. Skeen: In addition, please provide a supporting object class breakdown.

Response: A supporting object class breakdown for soil and water research will be provided for the record.

[The information follows:]

	FY 1999	FY 2000	FY 2001
Personnel Compensation			
11.0 Personnel compensation	18,785,000	18,478,000	21,128,000
12.0 Personnel benefits: Civ. Retirement .	4,321,000	4,250,000	4,860,000
Total Personnel Compensation	23,106,000	22,728,000	25,988,000

Other Services:				
21.0	Travel and transportation	2,406,000	2,588,000	2,914,000
23.0	Rent, communications, utilities	4,365,000	4,696,000	5,277,000
24.0	Printing and reproduction	176,000	190,000	213,000
25.0	Other Services	26,861,000	28,891,000	32,485,000
26.0	Supplies and materials	9,013,000	9,699,000	10,900,000
31.0	Equipment	6,162,000	6,631,000	7,452,000
Subtotal, All Other		48,983,000	52,695,000	59,241,000
Total		72,089,000	75,423,000	85,229,000

SOYBEAN RESEARCH

Mr. Skeen: By location, in table format, please provide a brief description of the work you are doing in connection with soybean research, the funding, and staff requirements for fiscal years 1999, 2000, and 2001.

Response: Research at these 29 locations is a nationally managed, fully coordinated, multidisciplanary approach to solving production and postharvest problems. The objectives of this research is shown below by location. The information on funding and staff for soybean research for fiscal years 1999, 2000, and 2001 will be provided for the record.

[The information follows:]

Albany, CA	Studies of genetically modified soybean oil and conventional oil for industrial use.
Ames, IA	Genetic research and genetic molecular mapping for soybean improvement.
Auburn, AL	Soil management to improve soil properties and soybean production.
Beltsville, MD	Gene mapping and genetic engineering, plant microbeinteractions with soybeans, including enhancing nodulation competitiveness; control of plant parasitic nematodes, including soybean cyst nematode; plant response to multiple environmental stresses, including temperative plant response to change in atmospheric carbon dioxide; and sustainable field crop systems.
Brookings, SD	Integrated crop management systems.
Columbus, OH	Production optimization, water quality, and flooding tolerance.
Columbia, MO	Cropping systems and water management strategies, and soybean genomics of seed composition.
Coshocton, OH	Management practices for erosion control and water quality.
Fargo, ND	Generate basic genetic knowledge about insect pests.
Florence, SC	Develop cropping systems to optimize water management.
Fort Collins, CO	Acquisition, maintenance, and preservation of germplasm for long-term storage.
Frederick, MD	Molecular characterization of soybean dwarf virus and epidemiology of soybean rust.
Gainesville, FL	Soybean response to water stress.
Lincoln, NE	Management practices to maximize production efficiency.
Madison, WI	Minimize harmful effects of bacterial pathogens.
Manhattan, KS	Grain odor assessment technology.
Morris, MN	Environmental and crop management limitations to soybean production.
New Orleans, LA	Modification of soybeans for value-added industrial products, and to optimize phosphate utilization in fats and food.
Oxford, MS	Develop sustainable cropping systems.

Peoria, IL	Product development, conversion of oil and protein for new industrial uses, and development of improved edible oils.
Raleigh, NC	Eliminate genetic and physiological limitations to production and enhance nitrogen fixation, and modify seed oil and protein properties.
St. Paul, MN	Biocontrol agents for controlling weeds.
Stoneville, MS	Develop insect resistant germplasm and improved varieties, improved weed control techniques, host resistance to soybean cyst nematodes, and improved understanding of soybean genetics and genomes.
Tifton, GA	Develop pesticide technology for control of nematodes, weeds, and insects.
Urbana, IL	Develop comprehensive soybean production technologies and maintain, evaluate, enhance, and distribute soybean germplasm.
Wooster, OH	Develop management practices for pest control and to develop germplasm for divergent environments.
Wyndmoor, PA	Develop oil products for industrial use and other value-added products.
Weslaco, TX	Identify biological control organisms of key insect pests and weeds.
West Lafayette, IN	Management practices for disease control, and develop improved germplasm; develop improved understanding of soybean protein.

	FY 1999		FY 2000		FY 2001	
	Funds	Scientist	Funds	Scientist	Funds	Scientist
Albany, CA	$549,400	2.5	$559,800	2.5	$559,800	2.5
Ames, IA	870,800	2.1	887,500	2.1	1,287,500	3.1
Auburn, AL	132,600	0.5	200,000	0.5	200,000	0.5
Beltsville, MD	3,760,900	12.3	3,628,500	9.9	3,628,500	9.9
Brookings, SD	182,800	0.9	179,300	0.6	179,300	0.6
Columbia, MO	263,900	1.0	1,375,100	3.1	1,204,700	3.1
Columbus, OH	117,000	0.5	119,300	0.5	119,300	0.5
Coshocton, OH	68,200	0.3	69,700	0.3	69,700	0.3
Fargo, ND	24,700	0.1	25,200	0.1	25,200	0.1
Florence, SC	194,900	0.8	210,900	0.8	210,900	0.8
Ft. Collins, CO	298,800	0.6	329,800	0.5	329,800	0.5
Frederick, MD	362,100	1.4	368,900	1.4	368,900	1.4
Gainesville, FL	133,500	0.5	136,300	0.6	136,300	0.6
Lincoln, NE	71,500	0.2	175,500	0.6	175,500	0.6
Madison, WI	20,800	0.1	21,300	0.1	10,000	0.1
Manhattan, KS	125,900	0.6	58,600	0.2	58,600	0.2
Morris, MN	304,700	1.0	360,900	1.0	360,900	1.0
New Orleans, LA	1,524,700	4.4	1,554,300	6.3	1,554,300	6.3
Oxford, MS	159,300	0.6	162,200	0.6	162,200	0.6
Peoria, IL	5,556,700	18.8	5,634,500	18.3	6,657,400	18.3
Raleigh, NC	1,096,600	6.4	1,119,100	6.4	1,119,100	6.4
St. Paul, MN	260,300	0.9	334,600	1.1	334,600	1.1
Stoneville, MS	3,464,200	10.4	3,794,200	12.8	3,912,300	12.8
Tifton, GA	37,500	0.2	38,300	0.2	38,300	0.2
Urbana, IL	2,023,500	8.5	2,041,900	7.0	2,124,000	7.0

Wooster, OH	292,100	1.4	299,100	1.4	87,900	0.4
Wyndmoor, PA	776,900	3.2	791,600	3.0	791,600	3.0
Weslaco, TX	--	--	234,200	0.1	234,200	0.1
W Lafayette, IN	779,400	3.0	793,900	3.0	793,900	3.0
Total	23,453,700	83.2	25,504,500	85.0	26,734,700	85.0

SOYBEAN-BASED INK

Mr. Skeen: By location, what is the funding and staff for soybean-based ink research for fiscal years 1999, 2000, and 2001?

Response: ARS conducts soybean-based ink research at Peoria, Illinois, with 0.6 scientists assigned to this work. Funding was $144,800 in fiscal year 1999, $138,600 in fiscal year 2000, and is expected to be $138,600 in fiscal year 2001.

STEEP II RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing in connection with STEEP II research, by location, including 1999 accomplishments.

Response: STEEP II has evolved to STEEP III. ARS has two locations involved in STEEP III research: Pullman, Washington, and Pendleton, Oregon. STEEP III continues the emphasis of STEEP I (economical soil erosion control) and STEEP II (economical soil erosion control plus water quality) and increases the scope to include broader no-till and direct seed issues and soil quality research. This program, more than its predecessors, emphasizes the involvement of producers in on-farm research and demonstration of natural resource conservation and management practices.

STEEP III is a collaborative effort between ARS and the Agricultural Experiment Stations and the Cooperative Extension Services of the states of Washington, Oregon, and Idaho. ARS is a full participant in project management, joint research, joint publications, and joint presentations to farmers of the three states.

Research at Pendleton, Oregon, is being conducted to reduce runoff and soil erosion. Crop management systems that conserve soil and water are being studied for the low (less than 12 inches) and intermediate (12 to 18 inches) precipitation zones. Studies are underway to improve crop residue management and seeding equipment performance, evaluate the impact of converting from intensive tillage to no-till on soil properties and the influence of long-term (initiated in 1931) management systems on runoff, sediment loss, and nutrient loss.

At Pullman, Washington, research is being conducted on agricultural management systems to improve soil quality to meet productivity, environmental, and food safety and water quality goals. Research is being conducted on one pass tillage operations for reduced erosion and improved soil quality. Research is also being conducted on integrated, no-till spring cropping systems to replace the traditional winter wheat/fallow system characterized by erosion, weeds, and diseases. The research focuses on developing economically feasible and environmentally sound conservation production systems.

Representative Accomplishments:

Erosion prediction models have not adequately estimated erosion for the Pacific Northwest (PNW) conditions of rainfall and snowmelt on thawing soils. ARS scientists have provided improved mathematical relationships for these conditions. They will be used in the ARS erosion prediction model, used by the Natural Resources Conservation Service (NRCS), known as the Revised Universal Soil Loss Equation (RUSLE).

Cooperative efforts between soil scientists and crop modelers at Pendleton, Oregon, and Agricultural Engineers at Pullman, Washington, resulted in development of improved RUSLE crop databases for the high-residue systems of the PNW. This will enable the NRCS and producers to make better management decisions where high quantities of residues would require excessive tillage that increases cost and adversely impacts soil quality.

A modification for no-till seeding equipment for improved residue management increased stand establishment of canola by 50 percent.

On a small plot at Pendleton, grain yields in no-till continuous winter wheat (continuous wheat since 1931) were 35 percent higher than those on conventional, intensively tilled plots. The microbial biology evolved over 70 years of continuous wheat on the plot site may counteract diseases that plague no-till wheat production in the region.

ARS scientists found that agricultural systems that remove excess surface wheat residue and use direct seed drilling results in greater organic matter in the surface layers and equal or better soil health than conventionally farmed systems. Although maintaining surface residues is beneficial to water infiltration and erosion, these results indicate the importance of minimum disturbance to soils and maintenance of an intact soil system.

In agriculture, as in other businesses, improvements in one area of interest are often offset by undesirable effects in another. ARS has shown, on the one hand, that after 16 years of wheat-fallow no-till, soil organic matter increased by 1200 pounds per acre from 48,500 pounds in an 8 inch furrow slice. Earthworms are thriving in no-till, but not in tilled plots. No-till plots of 16 years duration have a much higher infiltration capacity, and the plow plan is disappearing. On the other hand, ARS scientists have also shown that conventional summer fallow is much more effective in providing soil moisture near the soil surface at fall planting time than is any other treatment, including chemical-fallow no-till. The surface seal provided by conventional summer fallow minimizes water loss to evaporation, but unfortunately also slows infiltration of water, thereby accelerating water runoff and soil erosion. Much research remains to be done for the purpose of lessening the difficulty that producers still have in choosing the means to achieving their enterprise objectives.

The STEEP program has generated much interest among growers of the Pacific Northwest. About 1000 persons attended a recent conference and trade show sponsored by STEEP, focusing on direct seed cropping systems. Along with various individual publications, a book was published last year highlighting the accomplishments from STEEP titled "Conservation Farming in the United States. The Methods and Accomplishments of the STEEP Program."

Mr. Skeen: By location, what is the funding and staff for STEEP II research for fiscal years 1999, 2000 and 2001?

Response: The funding, location, and staff for STEEP II and STEEP III research is provided for the record.

[The information follows:]

Location	FY 1999 Funds	FY 1999 SYs	FY 2000 Funds	FY 2000 SYs	FY 2001 Funds	FY 2001 SYs
Pendleton, OR	$448,400	1.8	$457,900	1.7	$457,900	1.7
Pullman, WA	198,100	0.9	201,900	0.9	201,900	0.9
TOTAL	646,500	2.7	659,800	2.6	659,800	2.6

SWEET POTATO WHITEFLY

Mr. Skeen: What developments in sweet potato whitefly have occurred during the past year?

Response: During the past year, the second progress review of a new sweet potato whitefly research and technology transfer plan, that includes a proactive mechanism for technology transfer, was held in Albuquerque, New Mexico. The new plan identifies additional research and action activities to develop effective management methods and to increase our levels of technology transfer. The new plan, so far, has achieved an even higher level of success for control than the previous 5-year plan, with expanded participation from foreign countries, as well as the United States.

A complete areawide management system for sweet potato whitefly has been a goal and has been expanding in the affected States. This past year extensive fundamental, ecological, biological, and IPM research on the pest and its natural enemies continued to produce strategies for an ecologically-based management system. Crop management and community-oriented farm practices, such as water-use patterns, proximity of alternate host crops, and spatial considerations have been implemented in an effort to provide overall sweet potato whitefly population reductions. Areawide, community-based approaches covering infested crops are continuing to be implemented. Sweet potato whitefly resistance in several crop types has been identified, as well as whitefly-transmitted virus resistance, such as tomato mottle virus and other diseases. Resistant germplasm has been identified in alfalfa, peanut, melon, cotton, broccoli, collard and tomato. Studies on plant-insect interactions, physiological disorders and mechanisms of resistance and modes of action for whitefly and disease resistance has provided leads for scientists in identifying resistant germplasm for incorporation into agronomic types. Growers now have available cotton cultivars, which are less susceptible and have reduced losses from whiteflies. New commercial safer pesticides have been tested and made available, and new biological control agents have become available on the market. Other research outcomes have reinforced the need for intensive development of biological and other nonchemical control, for disease and whitefly resistant plant types, and for an expansion of our current knowledge of whitefly and natural enemy taxonomy, physiology, biochemistry, and genetics.

Extension and education activities of the consortium effort continue to play an essential role in wide-spread adoption of effective whitefly management practices. Integration of risk assessment information, spatial analysis, geographic information systems, communications networking, ecological modeling, and extension programs are continuing to improve our efforts at providing current and timely information to producers for implementation. Also, this past year, the Agricultural Research Service signed an agreement with the International Center for Tropical Agriculture (CIAT) based in Cali, Columbia to develop effective IPM strategies for the management of insect vectors, especially whiteflies and the viruses transmitted by them. Collaboration between ARS and CIAT has been initiated to link ARS' national consortium research on whitefly IPM with the international effort.

Mr. Skeen: By location, what is the funding and staff for sweet potato whitefly research for fiscal years 1999, 2000, and 2001?

[The information follows:]

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Phoenix, AZ	$1,770,600	6.5	$1,806,600	6.5	$1,806,600	6.5
Salinas, CA	81,900	0.2	126,100	0.3	83,600	0.2
Washington, DC	171,600	0.3	175,000	0.6	175,000	0.6
Ft. Pierce, FL	348,800	0.7	379,600	0.7	379,600	0.7
Tifton, GA	72,500	0.2	74,000	0.2	74,000	0.2
Peoria, IL	--	--	92,400	0.3	92,400	0.3
Beltsville, MD	371,900	1.3	379,400	1.5	754,400	2.9
Mississippi ST., MS	42,900	0.2	43,900	0.2	43,900	0.2
Stoneville, MS	133,300	0.4	195,300	0.5	135,800	0.4
Ithaca, NY	64,600	0.2	65,800	0.2	65,800	0.2
Fargo, ND	575,700	1.9	503,400	1.2	503,400	1.2
Charleston, SC	439,200	1.3	448,400	1.4	448,400	1.4
College Station, TX	212,400	1.1	216,200	0.7	216,200	0.7
Weslaco, TX	961,900	3.2	980,500	2.9	980,500	2.9
Montpellier, FR	175,700	0.2	178,000	0.2	178,000	0.2
TOTAL	5,423,000	17.7	5,664,600	17.4	5,937,600	18.6

TECHNOLOGY TRANSFER

Mr. Skeen: Please update the Committee on the ARS activities and cooperative efforts involved in transferring technology to industry and other users of ARS research.

Response: ARS has a proactive and targeted marketing and outreach program designed to inform private sector customers of ARS commercial opportunities. These efforts include:

- ARS participated in six national and international trade shows and meetings to reach a broader customer base and offer personal assistance on ARS technology opportunities and programs. In most cases ARS scientists play an integral role in presenting their technology to industry. This approach is twofold, it is designed to give industry first-hand knowledge of a featured technology, and activity engages ARS scientists in networking with industry participants.

- ARS also responded to inquiries from the States of Kansas, Louisiana, and Wisconsin regarding various ARS technologies and their development. M-F Industries in Milltown, Wisconsin, is continuing its interest in working with the ARS Meat Research facility in Beltsville, Maryland, involving an electrical food sterilization technique developed by the M-F Industries. The company is interested in working under a CRADA with the Beltsville facility.

- In fiscal year 2000, we anticipate targeting 50 percent of our communication resources to reach audiences who would be most probable to license or otherwise adopt ARS developed technologies. Additionally, we continue to meet regularly with the scientific community, venture capitalists, commodity and other agricultural organizations.

TROPICAL/SUBTROPICAL RESEARCH

Mr. Skeen: Please update the Committee on the tropical and subtropical research being carried out under section 406 of the Agricultural Trade and Development Assistance Act.

Response: ARS conducts tropical and subtropical research in Hawaii and Puerto Rico under Section 406 of the Agricultural Trade and Development Assistance Act. In Hawaii, research conducted under section 406 involves postharvest quarantine treatments to enhance the export of tropical fruit crops grown, genetic resource management of tropical fruits (especially pineapple, papaya, passion fruit, and tree fruits originating in tropical Asia), genetics and genetic improvement of tropical fruits such as pineapple and papaya, and production and marketing of certain horticultural and forage crops. In Puerto Rico, emphasis is placed on genetic resource management and genetic improvement of tropical fruit (especially banana and plantain), vegetable (especially dried beans), cereal (especially sorghum), beverage (especially cacao) and root crops, with special emphasis on evaluating new crop varieties and species thought to have economic potential for development in the Caribbean Basin. We also have educational programs in Puerto Rico to train individuals to produce and market certain crops. Training in entomology and plant pathology is also provided to help remove quarantine restrictions on commodities. These trained specialists then return to their farming communities and production areas to help train others in tropical/subtropical agriculture.

Mr. Skeen: By location, what is the ARS budget for this research for fiscal years 1999, 2000, and 2001?

Response: The budget for this research by location for fiscal years 1999, 2000, and 2001 will be provided for the record.
[The information follows:]

Location	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
Hilo, HI	$161,100	$162,700	$162,700
Mayaguez, PR	657,000	663,600	663,000
Total	818,100	826,300	826,300

Mr. Skeen: What is the total USDA budget for tropical/subtropical research for fiscal years 1999, 2000 and 2001 by location?

[The information follows:]

Agency	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
ARS	$818,100	$826,300	$826,300
CSREES	10,990,000	11,009,000	8,244,000
Total	11,808,100	11,835,300	9,070,300

URBAN PEST CONTROL RESEARCH

Mr. Skeen: How are fiscal year 2000 funds being used?

Response: Urban pest control research emphasizes the development of control methods for cockroaches, fire ants, pest ants, termites, and fleas. Objectives are to eliminate existing pest infestations, mitigate damage to indoor environmental quality caused by these insects (allergens and

biocontamination), and prevent future infestations. Research is directed toward the development of insecticide-free, or reduced-risk, least-toxic technologies. Research strategies include integrated pest management using novel environmentally stable baits, biological control agents, structural modifications promoting management of moisture and airflow (insect resistant construction), and non-toxic repellents to force pests from habitats and/or to prevent infestations. A number of recent accomplishments have resulted in support of customer needs in the Department of Defense, EPA, and the private sector pest control companies. Accomplishments include the development of a sophisticated system called "Precision Targeting," that allows an integration of technologies in a spatially-based risk-reduction plan that also reduces pesticide use by 50-80 percent. ARS scientists developed customized computer programming that links Geographic Information Systems (GIS) and Global Positioning Systems (GPS) with ground-based observations to implement this 'Precision Targeting' control technology. Testing is being conducted with military and private sector pest control practitioners. A multiple-species ant bait was developed for rapid assessment of all pest ant activity to subsequently target populations. Tests conducted with the Department of Defense and professional pest control companies resulted in over 75% pesticide reduction in hospitals and living quarters. Precision targeting, combined with a novel ARS-patented vacuum device was used to eliminate cockroaches in homes of asthmatic inner city children. For sustained management of these pests and their health implications, a detection system for allergens and biocontaminants from cockroaches was developed in cooperation with the Food and Drug Administration and field trials are being conducted with medical institutions involved in research with asthmatic children. Insect toxicology research resulted in the development of practical tests to detect insecticide resistance in cockroach populations so that use of ineffective pesticides is avoided. Candidate biocontrol agents were developed for fire ants, and field tests have been initiated in 9 states in cooperation with land grant institutions.

The Formosan Subterranean termites (FST) cost consumers approximately $1 billion per year, including the cost of repair. Since 1998, ARS has conducted a FST management project using fully integrated, community-based, large-area and site-specific pilot tests, research and education approach. The goal is to evaluate the application of the existing and developing FST control technologies, including; baiting, soil chemical barriers, fumigants, sanitation, physical barriers, GIS/GPS (geographical information system and geographic positioning system), wood preservation treatments, monitoring, and cost assessment. ARS is conducting research to improve the existing FST control technologies and develop new improved ones. At the end of a successful demonstration program, ARS will transfer the FST control technologies to end-users including pest control operators. Integration of the existing and developing control technologies will provide short-term and mid-term solution to the FST problem. New biologically-based, environmentally-friendly and sustainable FST control methods will provide long-term solutions.

Mr. Skeen: By location, what is the funding for urban pest control research for fiscal years 1999, 2000, and 2001?

[The information follows:]

Location:	FY 1999 Funds	FY 2000 Funds	FY 2001 Funds
Gainesville, FL	$ 794,300	$ 809,800	$666,600
New Orleans, LA	5,000,000	5,000,000	--
Total	5,794,300	5,809,800	666,600

UTILIZATION CENTERS

Mr. Skeen: For the record, please provide funding and staff levels for the four major utilization research centers for fiscal years 1999, 2000, and 2001.

[The information follows:]

	Fiscal Year		Fiscal Year		Fiscal Year	
Location	1999	FTE	2000	FTE	2001	FTE
Albany, CA--WRRC	$19,359,200	180	$20,423,100	182	$23,248,900	186
New Orleans, LA--SRRC	24,741,500	245	24,589,400	245	20,217,200	240
Peoria, IL--NCAUR	22,205,000	259	22,801,900	231	25,277,200	238
Wyndmoor, PA--ERRC	23,233,400	211	24,552,900	194	27,297,900	198

WHEAT DISEASE

Mr. Skeen: By location and wheat disease type, such as club wheat, vomitoxin, and virus, provide the staffing and funding amounts for fiscal years 1999, 2000, and 2001.

Response: The funding and locations where club wheat research and vomitoxin research will be provided for the record.

[The information follows:]

Club Wheat:	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Pullman, WA	$885,400	2.9	$897,100	2.9	$897,100	2.9

Vomitoxin:	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Albany, CA	--	--	$40,800	0.1	$40,800	0.1
Peoria, IL	$495,300	1.5	1,305,400	4.8	1,305,400	4.8
Beltsville, MD	--	--	61,400	0.1	61,400	0.1
St. Paul, MN	567,100	2.4	742,500	2.9	742,500	2.9
Raleigh, NC	--	--	74,400	0.3	74,400	0.3
Fargo, NC	167,900	0.6	420,300	1.2	420,300	1.2
Madison, WI	--	--	301,200	0.4	301,200	0.4
Headquarters	3,458,100	--	4,800,000	--	4,800,000	--
Total	4,688,400	4.5	7,746,000	9.8	7,746,000	9.8

Primary research locations and funding levels for research on wheat viruses such as barley yellow dwarf virus, wheat spindle streak virus, and soil-borne mosaic virus are as follows:

	FY 1999		FY 2000		FY 2001	
Location	Funds	SYs	Funds	SYs	Funds	SYs
Urbana, IL	$291,300	1.0	$297,100	1.0	$297,100	1.0
W. Lafayette, IN	270,500	1.1	275,600	1.0	275,600	1.0
Lincoln, NE	469,900	2.0	479,200	2.0	479,200	2.0
Ithaca, NY	231,200	1.0	235,200	1.0	235,200	1.0
Total	1,262,900	5.1	1,287,100	5.0	1,287,100	5.0

STAFFING OF RESEARCH FACILITIES

Mr. Skeen: Would you please provide for the record a table indicating, by location, your total laboratory capacity in terms of the number of scientists, indicating the total number of scientists assigned to that facility and the percent staffed?

Response: This table will be provided for the record.
[The information follows:]

United States Department of Agriculture
Agricultural Research Service
Status of Staffing of Agricultural Research Service Facilities
As of October 31, 1999
(Expressed in terms of scientific personnel)

Location	Total Capacity (Scientist)	Total in Use (Scientist)	Percent Staffed
Alabama:			
Auburn	17	17	100
Arizona:			
Phoenix	41	35	85
Tucson	39	30	77
Arkansas:			
Booneville	12	8	67
Stuttgart	25	19	76
California:			
Albany	208	166	80
Davis	10	3	30
Fresno	31	31	100
Riverside	34	34	100
Salinas	16	14	88
Colorado:			
Akron	14	13	93
Ft. Collins	41	34	83
District of Columbia	44	41	93
Florida:			
Gainesville	64	56	88
Miami	9	7	78
Orlando (Ft. Pierce)	32	22	69
Winter Haven	20	8	40
Georgia:			
Athens	126	119	94
Byron	13	8	62
Dawson	16	12	75
Tifton	35	20	57
Watkinsville	27	15	56
Hawaii:			
Hilo	22	12	55
Idaho:			
Aberdeen	9	9	100
Boise	15	15	100
Dubois	10	4	40
Kimberly	20	16	80
Illinois:			
Peoria	164	137	84
Indiana:			
W. Lafayette	15	14	93
Iowa:			
Ames	160	104	65
Kansas:			
Manhattan	47	31	66

Location	Total Capacity (Scientist)	Total in Use (Scientist)	Percent Staffed
Louisiana:			
Baton Rouge	12	12	100
New Orleans	120	120	100
Maryland:			
Beltsville	583	507	87
Frederick	20	10	50
Massachusetts:			
Boston	60	57	95
Michigan:			
East Lansing	21	13	62
Minnesota:			
Morris	22	15	68
Mississippi:			
Mississippi State	40	34	85
Oxford	29	26	90
Stoneville	61	48	79
Montana:			
Miles City	10	10	100
Sidney	17	17	100
Nebraska:			
Clay Center	75	61	81
New Mexico:			
Las Cruces	22	22	100
New York:			
Ithaca	30	21	70
Greenport	39	34	87
North Carolina:			
Raleigh	24	24	100
North Dakota:			
Fargo	80	51	64
Grand Forks	36	35	97
Mandan	24	12	50
Oklahoma:			
El Reno	28	19	68
Lane	13	13	100
Stillwater	19	16	84
Woodward	10	6	60
Oregon:			
Corvallis	33	28	85
Pendleton	12	12	100
Pennsylvania:			
University Park	21	17	81
Wyndmoor	150	124	83
Puerto Rico			
Mayaguez	18	12	67
South Carolina:			
Charleston	14	13	93
Florence	18	18	100
South Dakota:			
Brookings	12	7	58

Location	Total Capacity (Scientist)	Total in Use (Scientist)	Percent Staffed
Texas:			
Bushland	29	17	59
College Station	55	55	100
Houston	58	49	84
Kerrville	21	9	43
Lubbock	31	19	61
Temple	46	46	100
Weslaco	37	31	84
Utah:			
Logan	27	27	100
Washington:			
Pullman	11	2	18
Wapato	17	17	100
Wanatchee	15	6	40
West Virginia:			
Beaver	20	20	100
Kearneysville	24	22	92
Wisconsin:			
Madison	21	21	100
Wyoming:			
Cheyenne	18	11	61
Subtotal, (78 Locations with capacity of 10 or more)	3,439	2,820	82
All other locations (15 with capacity of less than 10.)	86	77	90
Total, Federal Facilities	3,525	2,897	82

The total includes all ARS scientists as well as 472 Non-ARS scientists.

NEW RESEARCH FACILITIES

Mr. Skeen: Please describe any laboratory space you have acquired during the past 12 months and indicate the reason why the facilities were acquired.

Response: ARS completed three laboratory facilities during the past 12 months as follows:

The Horticultural Research Laboratory, Fort Pierce, Florida. This new facility is 168,250 gross square feet of laboratory, office, headhouse, and greenhouse space. The facility has the capacity to house 26 scientists and 94 support personnel. The mission of the laboratory is to: a) Develop new control methods for insect pests of citrus and other subtropical fruits and vegetables; b) Conduct basic physiological, biochemical, and pathological research on postharvest problems of horticultural crops; c) Develop new citrus scion and rootstock varieties that have enhanced tolerance to environmental stress, resistance to diseases and pests, improved fruit quality and yield; d) Conduct research on bacterial, fungal, nematode, and viral diseases of subtropical crops to improve crop production; e) Develop alternatives/ solutions to environmental stresses that cause losses to crop growth, survival, and production; f) Develop alternative for methyl bromide fumigation.

The Plant Stress and Water Conservation Laboratory, Lubbock, Texas. This new facility is 62,000 gross square feet of laboratory, office, headhouse, and greenhouse space. The facility has the capacity to house 20 scientists and 45 support personnel. The mission of the Plant Stress and Water Conservation Laboratory is to conduct fundamental and applied research on the response of plants to thermal and water stress and to develop, through both traditional and molecular approaches, appropriate germplasm and management systems that reduce the impact of these stresses on crop yield and product quality.

The European Biological Control Laboratory (EBCL), Montpellier, France. This new facility is 13,685 gross square feet of laboratory, office, headhouse, and quarantine greenhouse space. The facility has the capacity to house 8 scientists and 26 support personnel. The overall goal of the research of EBCL is to suppress the invading Eurasian insect pests and weeds. The mission is to find and characterize natural enemies (insects, mites and pathogens).

Mr. Skeen: What is the status of each of the building and facility items funded in the fiscal year 2000 appropriation?

Response: The status of each of the building and facility items funded in the fiscal year 2000 appropriation is:

Project Location	$ Appropriated	Status
Albany, CA	$2.6 Mil	Design contract scheduled for award in the Third Quarter of fiscal year 2000.
Davis, CA	$9 Mil	Design contract awarded in January 2000.
Peoria, IL	$1.8 Mil	Design contract scheduled for award in the Third Quarter of fiscal year 2000.

New Orleans, LA	$5.5 Mil	Construction contract scheduled for award in the Fourth Quarter fiscal year 2001.
Beltsville, MD	$13 Mil	Construction contract scheduled for award in the Fourth Quarter of fiscal year 2000.
Greenport, NY	$8.2 Mil	Design contract for the Boiler Plant scheduled for completion in the Third Quarter of fiscal year 2000. Construction contract for Boiler Plant scheduled for award in late Fourth Quarter of fiscal year 2000. Sewage Decontamination Plant in study phase.
Wyndmoor, PA	$4.4 Mil	Construction contract for Phases 5 and 6 scheduled for award in the Second Quarter of fiscal year 2001.
Total	$44.5 Mil	

ARS-OWNED AIRCRAFT

Mr. Skeen: Please provide for the record a listing of aircraft owned by the Agricultural Research Service, including where the aircraft are located, the types of aircraft, and how the aircraft were acquired. Also indicate, for the record, the number of flying hours for each of these aircraft during fiscal years 1999 and 2000.

Response: The Agricultural Research Service owns and operates six aircraft located at College Station and Weslaco, Texas. The information on these aircraft will be provided for the record.

[The information follows:]

LOCATION	TYPE	METHOD OF ACQUISITION	FLYING HOURS FY 1999	FLYING HOURS FY 2000 (as of 3/1/00)
College Station, TX	Cessna T188C	Purchase	10	6
	*Air Tractor 402B	Trade In	29	8
	Cessna U206B	Excess	6	2
	Hiller 12E	Excess	4	1
Weslaco, TX	Cessna TU206G	Excess	49	38
	Cessna 404	Excess	127	12
TOTAL FOR ALL			**225**	**67**

* Received waiver from the General Services Administration to allow exchange of existing aircraft Cessna P206 for new aircraft. Received aircraft in October 1996.

ARS-OWNED AIRCRAFT

Mr. Skeen: What were the fiscal year 1999 maintenance costs for each of the ARS-owned aircraft?

[The information follows:]

LOCATION	TYPE	MAINTENANCE COSTS
College Station, TX	Cessna T188C	$ 700
	Air Tractor 402B	2,465
	Cessna U206B	480
	Hiller 12E	440
Weslaco, TX	Cessna TU206G	1,520
	Cessna 404	6,710
TOTAL FOR ALL		12,315

FACILITIES REQUIREMENTS

Mr. Skeen: The fiscal year 2001 budget request for buildings and facilities reflects a funding level of $39.3 million for modernization activities for six facilities. Would you please list for the record all of your planned modernization or construction projects, showing both the facility and the estimated needs?

[The information follows:]

MODERNIZATION	BALANCE ESTIMATED COSTS
Beltsville, Maryland	$ 83,000,000
New Orleans, Louisiana	8,400,000
Peoria, Illinois	52,200,000
Plum Island, New York	110,000,000
Wyndmoor, Pennsylvania	13,030,000
Albany, California	19,600,000
National Animal Disease Center, Iowa	379,000,000
Weslaco, Texas	14,208,000
Manhattan, Kansas	8,250,000
East Lansing, Michigan	19,700,000
National Agricultural Library, Maryland	26,100,000
El Reno, Oklahoma	4,800,000
USNA, District of Columbia	19,400,000
Fort Collins, Florida	6,200,000
Laramie, Wyoming	5,600,000
Miles City, Montana	5,300,000
Stoneville, Mississippi	32,100,000
Athens, Georgia	125,000,000

CONSTRUCTION	BALANCE ESTIMATED COSTS
Maricopa, Arizona	21,700,000
Stoneville, Mississippi	11,400,000
Logan, Utah	10,000,000
Athens, Georgia	27,700,000
Charleston, South Carolina	15,860,000
Hilo, Hawaii	52,000,000
Fort Pierce, Florida	3,000,000
Urbana, Illinois	3,600,000

The "Balance Estimated Costs" amount represents remaining modernization and construction project funding requirements that were either originally identified via facility condition studies, the development of Program of Requirement documents, or design drawings. Funding to date for these projects was either congressionally funded through the Agency's Building and Facilities account, or through the Agency's Annual Repair and Maintenance budget line item appropriation.

Mr. Skeen: Please provide an explanation of the long-term project requirements and an object class breakdown for the $9 million increase requested for the ARS-APHIS Master Plan for the Ames, Iowa facility.

Response: At this time the ARS-APHIS Master Plan has been completed in draft and it is scheduled to be finalized in fiscal year 2000. Projected needs are $379 million if funding is provided between fiscal year 2001 and fiscal year 2010 for the consolidation of the ARS and APHIS facilities. This will result in a world-class facility for biocontainment research, diagnostics, and evaluation. The project needs are subject to revision in the final version of the Master Plan.

The $8 million increase in fiscal year 2001 is for the design of approximately 48,000 gross square feet of Biological Safety Level (BSL)-3-AG animal research facilities and 103,000 gross square feet of animal housing facilities (BSL-2) for ARS and APHIS. The remaining $1 million request will be used to support the design and construction of various site utility upgrades. An estimated $72 million will be needed in fiscal year 2003 to fund the construction of these new facilities. Additional funds will be needed to support other design and construction requirements of the Master Plan in fiscal year 2002.

It is anticipated that $3.461 million will be obligated to Object Class 25.2, Other Services and the remaining $5.539 million under Object Class 32.0, Land and Structures.

Mr. Skeen: Please list all ARS Buildings and Facilities projects that are executable during fiscal year 2001, but were not included as part of the Administration's final budget request.

Response: A list of buildings and facilities projects executable during fiscal year 2001 will be provided for the record.
[The information follows:]

Project/Location	Estimated Need
New Poultry Hatchery Beltsville, MD	$ 200,000 - Design
New Dairy Heifer Barns Beltsville, MD	180,000 - Design

New Swine Production Facility Beltsville, MD	900,000	- Design
New Poultry Parasitology Barn Beltsville, MD	180,000	- Design
New Beef Research Facility Beltsville, MD	500,000	- Design
New Beef Parasitology Barn Beltsville, MD	100,000	- Design
New Small Animal Facility Beltsville, MD	400,000	- Design
Dairy Barn 167 Beltsville, MD	280,000	- Design
NCAUR Modernization Peoria, IL	5,900,000	- Construction, Phase 1
ERRC Modernization Wyndmoor, PA	3,500,000	- Construction, Phase 7 Design, Phase 8
Renovate Lab and Animal Wings Bldg. 101, Greenport, NY	15,000,000	- Design
Avian Disease & Oncology Lab East Lansing, MI	6,000,000	- Construction, Phase 1
Southeast Poultry Research Lab Athens, GA	5,900,000	- Planning and Design
National Agricultural Library Beltsville, MD	800,000	- Design and Construction
Greenhouse Complex Renovation U.S. National Arboretum (USNA) Washington, DC	320,000	- Design
Education and Visitor Center USNA, Washington, DC	110,000	- Planning
Laboratory/Office Facility USNA, Washington, DC	700,000	- Planning and Design
Biological Control Laboratory Stoneville, MS	11,400,000	- Construction
Richard Russell Research Center Athens, GA	1,200,000	- Modernization, Phase 1
Jamie Whitten Delta States Research Center Stoneville, MS	2,300,000	- Planning and Design
Kika de la Garza Subtropical Agricultural Research Station Weslaco, TX	6,100,000	- Design and Construction

Grain Marketing & Research Center Manhattan, KS	8,250,000	- Construction, Phases 3-4
Crop Improvement & Protection Research Center Salinas, CA	2,100,000	- Planning, Design, Construct
Horticultural Research Laboratory Vegetable/Ornamental Farm Fort Pierce, FL	3,000,000	- Planning, Design, Construct
Poisonous Plant Research Lab Logan UT	9,000,000	- Construction
Grazinglands Research Laboratory El Reno, OK	4,800,000	- Planning, Design, Construct
U.S. Vegetable Laboratory Charleston, SC	5,500,000	- Planning and Design, and Construct Items Deleted From Phase 1
Plant Physiology & Genetic Research Laboratory Urbana, IL	3,600,000	- Construction
Sugar Beet, Bean, & Cereal Research Laboratory East Lansing, MI	1,600,000	- Planning, Design, Construct
Poultry Microbial Safety Research Laboratory Watkinsville, GA	500,000	- Planning
Air Quality-Plant Growth and Development Research Laboratory Raleigh, NC	500,000	- Planning and Design
Soil and Water Research Laboratory Baton Rouge, LA	900,000	- Planning and Design

WESLACO, TEXAS

Mr. Skeen: According to your response to last year's question, phase 3 construction had been delayed until fiscal year 2000. Please update the Committee on your progress in fiscal year 1999 and 2000 for the replacement of the Weslaco, Texas, research facility.

Response: The modernization effort is being accomplished in 6 phases. Phase 1 demolition of existing dilapidated structures and the Phase 2 utility and site upgrade effort were completed. Renovation of two existing greenhouses and two new greenhouses were also completed. Construction of Phase 3 (new 24,900 gross square feet (GSF) laboratory/office) was scheduled for completion in the third quarter of fiscal year 2000. However, this was delayed approximately 16 months due to a contract default. Two existing greenhouses are being replaced as part of the modernization effort.

The scope of work for the remainder of the modernization include research office/laboratories, headhouse/greenhouses, chemical storage, pesticide storage, and maintenance shops.

BACKLOG OF FACILITY REPLACEMENT

Mr. Skeen: For the record, please provide a list of all ARS facilities and the known backlog of replacement or major repairs.

Response: A list is provided below depicting the Agency's known planned repair, maintenance, replacement, and renovation activities over the next 10 years (2000-2009). This list looks prospectively at facilities needs versus retrospectively and is therefore not necessarily a backlog of replacement or major repairs for each location.

The Repair and Maintenance Program is specifically intended to improve ARS facilities within six guidelines: protection of life, protection of property, implementation of mandated regulations, compliance with building codes, more effective space utilization, and implementation of energy conservation. The definition of repair as customarily applied to ARS facilities and buildings is the restoration and repair of components of an existing facility to a condition substantially equivalent to its original state and efficiency with the repair work complying with the requirements contained in the current applicable codes and standards. Typical examples of this type of work are:

- o HVAC/electrical/plumbing system replacement due to age.
- o Roof replacement/building envelope repair/maintenance.
- o Site utility system replacement.
- o Fire protection installation/replacement.
- o Fume hood replacement/modification to correct air flow deficiency.
- o Road paving/pedestrian and vehicular circulation/correct site drainage.

Also included in the following list are costs for replacement or major repairs to facilities and Hazardous Waste Clean-up needs.

Location	Estimated Costs
ALABAMA	
Auburn	$941,280
ARIZONA	
Phoenix/Maricopa	$23,366,000
Tuscon	$385,000
ARKANSAS	
Booneville	$1,113,000
Fayetteville	$754,720
Stuttgart	$11,212,680
CALIFORNIA	
Albany	$25,137,900
Parlier/Fresno	$3,157,740
Riverside	$1,728,860
Salinas	$2,594,880
COLORADO	
Akron	$308,460
Ft. Collins	$2,864,120

DELAWARE	
Newark	$487,600
DISTRICT OF COLUMBIA	
USNA	$28,891,360
FLORIDA	
Brooksville	$892,520
Canal Point	$964,600
Ft. Lauderdale	$609,500
Gainesville	$408,100
Miami	$1,000,000
Orlando/Ft Pierce	$3,000,000
Winter Haven	$174,900
GEORGIA	
Athens	$167,900,000
Byron	$2,646,820
Dawson	$75,260
Experiment/Griffin	$757,900
Tifton	$1,453,260
HAWAII	
Hilo	$47,085,200
IDAHO	
Aberdeen	$2,120,000
Boise	$809,840
Dubois	$324,360
Kimberly	$1,494,600
ILLINOIS	
Peoria	$79,560,420
Urbana	$3,600,000
INDIANA	
West Lafayette	$832,100
IOWA	
Ames	$379,000,000
KANSAS	
Manahattan	$9,383,120
LOUISIANA	
Baton Rouge	$6,906,960
New Orleans	$20,370,020
MARYLAND	
Beltsville	$439,154,820
Beltsville (NAL)	$27,649,040
Frederick	$826,800
MASSACHUSETTS	
Boston	$4,087,360
MICHIGAN	
East Lansing	$19,700,000
MINNESOTA	
Morris	$7,179,380
St. Paul	$1,973,720

MISSISSIPPI	
Mississippi State	$2,740,100
Oxford	$1,812,600
Poplarville	$1,933,440
Stoneville	$45,087,100
MISSOURI	
Columbia	$1,829,560
MONTANA	
Miles City	$5,300,000
Sidney	$4,142,480
NEBRASKA	
Clay Center	$6,668,460
Lincoln	$354,040
NEW MEXICO	
Las Cruces	$63,600
NEW YORK	
Geneva	$1,071,660
Ithaca	$2,456,020
Greenport	$110,000,000
NORTH CAROLINA	
Raleigh	$1,245,500
NORTH DAKOTA	
Fargo	$1,680,100
Grand Forks	$1,532,760
Mandan	$2,158,160
OHIO	
Columbus	$5,300
Coshocton	$485,480
Wooster	$21,200
OKLAHOMA	
El Reno	$12,172,414
Lane	$495,020
Stillwater	$2,183,600
Woodward	$1,025,020
OREGON	
Burns	$362,520
Corvallis	$3,965,460
Pendleton	$627,520
PENNSYLVANIA	
University Park	$7,951,060
Wyndmoor/Philadelphia	$20,005,860
SOUTH CAROLINA	
Charleston	$15,860,000
Clemson	$238,500
Florence	$1,751,120
SOUTH DAKOTA	
Brookings/Madison	$1,726,740

TEXAS	
Beaumont	$32,860
Bushland	$3,340,060
College Station	$18,510,780
Houston	$1,477,640
Kerrville	$1,578,340
Lubbock (Worksite at Big Spring)	$13,348,580
Temple	$1,345,140
Weslaco	$22,218,660
UTAH	
Logan	$14,716,100
WASHINGTON	
Prosser	$519,400
Pullman	$3,417,440
Wenatchee	$736,700
Yakima	$153,700
WEST VIRGINIA	
Beckley	$2,418,920
Kearneysville	$2,311,860
WISCONSIN	
Madison	$3,589,160
WYOMING	
Cheyenne	$1,712,960
Laramie	$5,600,000
PUERTO RICO	
Mayaguez	$2,460,260
Total	$1,693,325,154

REPAIR AND MAINTENANCE

Mr. Skeen: What is your budget for repair and maintenance of facilities in fiscal years 1999, 2000 and 2001?

Response: The fiscal years 1999 and 2000 repair and maintenance budget was $18.263 million. This amount includes $14.247 million in Agency funds, $900,000 for the National Agricultural Library, $740,000 for the USNA, and 2.376 million in BARC Renaissance 93 funds. The Agency proposes the same funding level for fiscal year 2001.

Mr. Skeen: How were these funds used in fiscal year 1999?

Response: Some of the types of repair and maintenance projects funded in fiscal year 1999 include: roof repair, HVAC repair, plumbing repairs, upgrade to sewage lines, electrical repairs, fencing replacement, painting, pavement repair, asbestos and lead abatement, accessibility projects, and replacement of fire protection systems, Y2K upgrades, energy retrofits and audits, and facility assessment surveys.

Mr. Skeen: What was the largest single expenditure?

Response: The largest single expenditure of repair and maintenance funds

covered the modernization of building and facility modernization at El Reno, OK. This expenditure totaled $1,857,746.

CONTINGENCY FUND

Mr. Skeen: The Contingency fund, established by Congress in 1962, provides for unforseen research needs. How much is budgeted for contingency for fiscal years 2000 and 2001?

Response: Congress did not appropriate specific funding for the Contingency Fund in fiscal year 2000.

Mr. Skeen: Please provide the details of any specific use of the Contingency Fund in fiscal year 1999 and any use, so far, in fiscal year 2000.

Response: Details of specific use of fiscal year 1999 funds will be provided for the record:
[The information follows:]

Releases	Amount
Asian Longhorned Beetle Research	
Beltsville, Maryland	$157,000
Newark, Delaware	43,000
Pheromone/Pink Hibiscus Mealybug Research	
Beltsville, Maryland	155,623
Fresno, California	200,000
Turkey Poults Enteritis Mortality Syndrome	
Athens, Georgia	200,000
Storm damage to vehicle, air handlers and tree	
Gainesville, Florida	32,900
Water damage to building from fire	
Beltsville, Maryland	40,000
Replacement Incinerator (design)	
Laramie, Wyoming	100,000
Total, Contingency Research Fund	928,523

No Contingency Funds have been appropriated for fiscal year 2000.

Mr. Skeen: Some of the items in last years list appeared to be ongoing type research items rather than unforeseen. Please describe the approval process the agency or department uses to approve items under the Contingency Fund. Please include a copy of your authorization with your answer.

Response: The Administrator's Council consisting of the Agency's top management assists the Administrator in making decisions on the selection of projects to be funded from the account to cover research problems, meet unforeseen special research needs, and to deal with emergency disasters. The basic authority for the Contingency Fund is attached for the record.
[The information follows:]

87TH CONGRESS } HOUSE OF REPRESENTATIVES { REPORT
1st Session } { No. 448

DEPARTMENT OF AGRICULTURE AND RELATED AGENCIES APPROPRIATION BILL, 1962

JUNE 2, 1961.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. WHITTEN, from the Committee on Appropriations, submitted the following

REPORT

[To accompany H.R. 7444]

The Committee on Appropriations submits the following report in explanation of the accompanying bill making appropriations for the Department of Agriculture and related agencies for the fiscal year 1962. The bill covers estimates contained in the 1962 Budget on pages 141–145, 331–410 and 420, as amended by House Documents 112 and 155.

This bill provides funds for the general operations of the Department, including the Commodity Credit Corporation and various activities such as research, extension, soil and water conservation, loans, crop insurance, and administrative services.

The estimates considered by the Committee include requested appropriations of $1,409,835,000 for regular activities of the Department for fiscal year 1962; $1,017,610,000 for restoration of capital impairment of the Commodity Credit Corporation for fiscal year 1960; $1,951,915,000 for reimbursement to Commodity Credit Corporation for foreign assistance (P.L. 480, International Wheat Agreement, etc.) and other special activities for fiscal year 1961; $1,709,849,000 to finance Public Law 480 and other foreign assistance programs during fiscal year 1962; and $35,000 for related agencies.

The bill recommended by the Committee includes $1,379,006,000 for regular activities for fiscal year 1962; $1,951,915,000 for reimbursements to CCC for foreign assistance and special programs for fiscal year 1961; $1,017,610,000 for restoration of CCC capital impairment

CONTINGENCY RESEARCH FUND

To meet the needs of Agriculture, the Department must be in a position to take effective research action at once when a serious problem arises. It should have a source of funds from which to draw immediately, without having to negotiate a transfer of funds from other work.

For instance, the spotted alfalfa aphid invaded the Southwest in 1954 and spread throughout the Western States in the next 2 or 3 years. The Department shifted about $40,000 from other work to develop chemical controls, look for parasites and predators, and develop resistant varieties. An adequate contingency fund would have enabled the scientists to save at least a year in the period required for eradication—at a time when the spotted alfalfa aphid was costing growers $30 to $40 million annually.

Another invader has been the face fly, which came into New England from Canada some years ago. Suddenly, in 1959, it threatened to become a serious menace to our livestock. Again, the emergency was met by shifting $30,000 to $40,000 from other programs. This worrisome pest has now spread across the country as far west as Nebraska. Department entomologists feel that they lost valuable time in bringing this threat under control due to the lack of a contingency fund from which to draw.

To enable the Department to move in on such problems quickly, the Committee has established for the first time a contingency research fund of $1,000,000 for fiscal year 1962. The fund will be available to the Administrator of the Agricultural Research Service to expedite work on research problems and to meet special research needs as they arise.

Such a fund will also be available to give increased emphasis to some of the many special problems presented to the Committee by Members of Congress and other witnesses this year, including basic research on wheat and grains, research on the improved digestibility of dry edible beans, barley and malt research, research on pear decline, forage and range research, soybean research, poultry research—particularly with reference to airsacculitis—soil and water conservation research, and others. In many of these areas, the work might best be done through contracts with qualified research institutions.

LIBRARY FEES

Mr. Skeen: Once again, last year the Department testified that its proposal for fees for use by the National Technical Information Service was delayed. Did you publish the final rules in the Federal Register? Please provide a copy for the record.

Response: The Final Rule was published in the Federal Register February 10, 2000. The new billing structure will be effective April 1, 2000. A copy of the Final Rule is included.

[The information follows:]

experience a slight increase in income as a result of the interim rule.

Nurseries and Christmas tree growers that move a substantial number of shipments interstate from the generally infested areas would be able to minimize treatment costs by treating their premises for gypsy moths under a compliance agreement with USDA. Treatment would cost businesses between $10 and $20 per acre. This alternative would enable nurseries and Christmas tree growers to issue their own certificates for interstate shipments and would be less costly than treating individual shipments. The entities that would be most likely to choose this alternative are nurseries that move a substantial number of shipments interstate from the generally infested areas and that treat their premises for other pests in addition to the gypsy moth. Producers that do not operate under a compliance agreement with APHIS, but that treat their premises under this option, would receive certification for each shipment from an inspector.

There are approximately 687 entities in the newly regulated areas that will incur costs from the interim rule. These entities include 286 nurseries, 179 Christmas tree growers, 85 loggers, and 41 sawmills. The vast majority of these entities are small businesses.

Approximately 100 of the affected entities are in Indiana. These entities include 70 nurseries, 20 loggers, and 10 Christmas tree growers. Nurseries in Indiana sold an average of $127,206 worth of crops in 1997, and Christmas tree growers had average sales of $16,332. Average sales figures for loggers and sawmills in Indiana are not available, but nationwide, loggers and sawmills averaged sales of $3.3 million in 1992. Only about 10 percent of the affected entities' shipments are expected to leave the generally infested area, and only half of those, or 5 percent overall, will require treatment.

Approximately 187 of the affected entities are in Michigan. There are approximately 19 nurseries and 168 Christmas tree growers in the newly regulated areas. We do not expect that any treatments will be necessary for shipments from the newly regulated areas in Michigan because gypsy moth populations are low in those areas due to climatic conditions. However, time, salary, and recordkeeping costs for self-inspections will be incurred for shipments leaving the regulated areas. We estimate that 50 percent of the Christmas trees, 20 percent of the logs, and less than 2 percent of the nursery stock produced in the newly regulated areas are shipped interstate to noninfested areas. Nurseries and Christmas tree growers will also incur a $30 per acre fee for gypsy moth inspections, which are mandated by the State as a licensing requirement. This inspection fee represents about 1.5 percent of the average per-acre value of sales of harvested cut Christmas trees in Michigan in 1997.

Approximately 240 of the affected entities are in Ohio, including 135 nurseries, at least 96 Christmas tree growers, and 9 sawmills. Nurseries in the newly regulated areas had average sales of $19,218 in 1997, while Christmas tree growers averaged $22,505. Sawmills averaged $1.7 million in shipments in 1992, indicating that at least some of them are not small businesses. We do not know how many shipments are likely to be shipped out of the newly regulated areas in Ohio.

There are approximately 98 affected entities in Virginia and 62 affected entities in Wisconsin. However, we do not anticipate any additional costs for entities in the newly regulated areas in Virginia and Wisconsin since they do not send shipments interstate from the generally infested areas.

Under these circumstances, the Administrator of the Animal and Plant Health Inspection Service has determined that this action will not have a significant economic impact on a substantial number of small entities.

List of Subjects in 7 CFR Part 301

Agricultural commodities, Plant diseases and pests, Quarantine, Reporting and recordkeeping requirements, Transportation.

PART 301—DOMESTIC QUARANTINE NOTICES

Accordingly, we are adopting as a final rule, without change, the interim rule that amended 7 CFR part 301 and that was published at 64 FR 40509–40511 on July 27, 1999.

Authority: 7 U.S.C.147a, 150bb, 150dd, 150ee, 150ff, 161, 162, and 164–167; 7 CFR 2.22, 2.80, and 371.2(c).

Done in Washington, DC, this 4th day of February, 2000.

Richard L. Dunkle,

Acting Administrator, Animal and Plant Health Inspection Service.

[FR Doc. 00–3076 Filed 2–9–00; 8:45 am]

BILLING CODE 3410–34–P

DEPARTMENT OF AGRICULTURE

Agricultural Research Service

7 CFR Part 505

National Agricultural Library Fees for Loans and Copying

AGENCY: Agricultural Research Service, USDA.

ACTION: Final rule.

SUMMARY: The Department of Agriculture (USDA) is establishing a fee schedule for loans of materials, and establishing a fee schedule for copying of materials from the collections of the National Agricultural Library. Fees generated will be used to defray costs of document delivery and maintenance of the collection.

DATES: Effective April 1, 2000.

ADDRESSES: Address all correspondence to Eileen McVey, Access Services Librarian, Document Delivery Services Branch, National Agricultural Library, Agricultural Research Service, Room 300, 10301 Baltimore Ave., Beltsville MD 20705–2351. Telephone: 301–504–6503. Email: userfees@nal.usda.gov

FOR FURTHER INFORMATION CONTACT: Carol Ditzler, Head Document Delivery Services Branch, National Agricultural Library, Agricultural Research Service, Room 300, 10301 Baltimore Ave., Beltsville MD 20705–2351.

SUPPLEMENTARY INFORMATION: This rule was published as a proposed rule for comment on August 16, 1999. Two comments were received. One comment indicated that fee changes were reasonable and that the price increase was viewed as having a positive effect upon the ability of patrons to obtain materials. The second comment viewed the increase in fees as excessive in terms of photocopying. The National Agricultural Library believes the fees are comparable to those of other research libraries. A random sampling of 15 academic and research libraries that do charge flat fees indicated a photocopy charge that ranged from a low of $8.00 when using OCLC IFM service to a high of $25.00 for non-IFM requests. (IFM is a service provided by the Online Computer Library Center (OCLC) in Dublin, Ohio, which credits and debits charges for libraries that participate resulting in a reduction of costs for invoicing.) The library, therefore, considers a flat fee of $13.00 for photocopies on the low side of a median cost for such services.

Classification

This rule has been reviewed under Executive Order 12866, and it has been

determined that it is not a "significant regulatory action" rule because it will not have an annual effect on the economy of $100 million or more or adversely and materially affect a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities. This rule will not create any serious inconsistencies or otherwise interfere with actions taken or planned by another agency. It will not materially alter the budgetary impact of entitlement, grants or user fees, or loan programs, or the rights and obligations of recipients thereof, and does not raise novel legal or policy issues arising out of legal mandates, the Presidents's priorities, or principles set forth in Executive Order 12866.

Regulatory Flexibility Act

The Department of Agriculture certifies that this rule will not have a significant impact on a substantial number of small entities as defined in the Regulatory Flexibility Act, Pub. L. No. 96-534, as amended (5 U.S.C. 601, *et seq.*).

Paperwork Reduction Act

In accordance with the Office of Management and Budget (OMB) regulations (5 CFR part 1320) which implement the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 35), the information collection and record keeping requirements that will be imposed in implementation of this proposed rule have been submitted to OMB. This collection was approved by OMB on September 30, 1999, with OMB NO.: 0518–0027 and an expiration date of 09/30/2002.

Background

Section 1410A of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3125a), as added by section 1606(a) of Pub. L. 101–624, expanded existing statutory authorities for the NAL. In particular, section 1410A(e) authorized the NAL Director to make copies of NAL bibliographies, to make microforms and other reproductions of books and other library materials in USDA, to provide any other library and information products and services, and to sell these products and services at such price (not less than the total costs of disseminating the products and services) as the Secretary of Agriculture deems appropriate. Receipts from such sales must be deposited to the credit of appropriations available to the NAL and remain available until expended.

Currently, USDA regulations (7 CFR part 1, Appendix A) supply a fee schedule for copying of NAL materials requested under the Freedom of Information Act (FOIA), 5 U.S.C. 552. NAL in this regulation adopts a fee schedule for copying of NAL materials pursuant to interlibrary loan or other research requests, and to cover the costs of interlibrary loans of materials from NAL collections.

Fee Schedule for Loans of Materials From the NAL Collection

The NAL will charge fees for interlibrary loans of original materials from the NAL collection to other non-Federal and non-USDA libraries and institutions in the United States and Canada. By original materials, it is meant that NAL will provide loans of original works, and not copies, except in rare instances where works are too fragile or valuable for shipment. Libraries are encouraged to obtain materials locally and to view the NAL as a library of last resort. Loans directly to individuals are not permitted.

A flat fee per loaned item will be charged. Fees generated will be used to recover actual processing costs and to offset general wear and tear on the collection when items are loaned. The amount is based on a study of current library costs and market comparisons. There will be no charge for renewals.

Costs for replacement of lost or damaged materials will be the actual cost to purchase a replacement or a flat fee if the exact cost cannot be determined. A processing cost will be added to all lost or damaged materials.

Fee Schedule for Paper Copying, Duplication, and Reproduction Services from the NAL Collection

The NAL will charge a fee for photocopying and reproduction services separate from the fee schedule applicable to FOIA requests under 7 CFR part 1, Appendix A, for paper copying, duplication, and reproduction services provided to non-USDA and non-federal libraries and institutions in the United States. These services will be provided only in response to an interlibrary loan request from a library. Use of the interlibrary loan system ensures that NAL receives the request in an appropriate form and format for response. In some exceptions, services will be provided for requests from individuals who have not been able to obtain materials through their local resources or who have made special arrangements with the Special Collections section using their forms.

Copying of articles is subject to a maximum limitation of 50 pages per article for purposes of copyright compliance. This is based on CONTU Guidelines (National Commission on New Technological Uses of Copyright Works), and the Code of Federal Regulations (Title 17, and Title 37, Volume 1).

The NAL will charge in its schedule of fees for photocopying of paper materials and paper copying of microfiche or microfilm. NAL is switching from a per page-based charge to a per item flat fee because, historically, the average request is between 10 and 20 pages. Establishing a flat fee allows the customer to estimate their costs more effectively and allows the library to eliminate the cost of multiple steps currently necessary in determining pro-rated fees. Fees established are based on actual costs (staffing, contract costs, supplies, copier maintenance, normal wear and tear on the collection, delivery costs, etc.) as well as based on a review of comparable fees across the nation charged by other research and academic libraries. All fees will apply to non-USDA and non-federal library requests that meet standard interlibrary loan format requirements and apply to copying of materials from the NAL collections only.

NAL also will charge a flat rate for the costs of duplication of NAL owned microfiche and microfilm. Photographic services from NAL Special Collections will be charged at cost for reproduction of the photo product, plus a flat rate for preparation costs.

Payment Submission Requirements

The National Technical Information Service (NTIS) within the United States Department of Commerce provides a number of services to Federal Agencies, one of which is billing and collection services. NAL uses NTIS as the preferred method for invoicing and payment of fees under this fee schedule. Use of NTIS by NAL is preferred because it is the only agency currently providing this service to Federal offices. NAL encourages institutional users to establish deposit accounts with NTIS if needed. Payment for services will be made by check, money order or credit card in U.S. funds directly to the NTIS upon receipt of an invoice from NTIS. Subject to service charges for the actual costs of performing the invoicing service, funds received by NTIS will be returned to NAL to the credit of the appropriation account charged with the costs of providing the loan or copying service.

List of Subjects in 7 CFR Part 505

Agricultural research, Agriculture, Libraries, Research, User fees.

For the reasons set out in the preamble, chapter V of Title 7 of the Code of Federal Regulations is amended as set forth below:

Part 505 is added to read as follows:

PART 505—NATIONAL AGRICULTURAL LIBRARY FEES FOR LOANS AND COPYING

Sec.

505.1 Scope and purpose.
505.2 Fees for loans of materials in library collections.
505.3 Fees for copying, duplicating, and reproduction of materials in library collections.
505.4 Reserved.
505.5 Reserved.
505.6 Payment of fees.

Authority: 5 U.S.C. 301; 7 U.S.C. 3125a.

§ 505.1 Scope and purpose.

These regulations establish fees for loans, paper copying, duplication, or reproduction of materials in the collections of the National Agricultural Library (NAL) within the United States Department of Agriculture (USDA).

§ 505.2 Fees for loans of materials in library collections.

(a) NAL will make loans of original materials from its collections, and charge fees for such loans, to other non-Federal and non-USDA libraries and institutions in the United States and Canada only. Loans will not be made directly to individuals.

(b) Loans will be made at a flat fee of $15.00 per loaned item.

(c) Cost for replacement of lost or damaged items will be the actual cost to purchase a replacement plus a $50.00 processing fee; or if the cost cannot be determined, a flat rate of $75.00 for monographs or $150.00 for audiovisuals per item, plus a $50.00 processing fee.

(d) All services in this section will incur a billing surcharge per invoice generated in addition to the above fees which may change as vendor's charges change. This fee, currently $10.00, is billed as a direct cost recovery based on charges to the library by the billing vendor. Interlibrary loan requests submitted by participants in the ILL Fee Management (IFM) program under the Online Computer Library Center, Inc. (OCLC) will not incur the billing surcharge as their activities will not generate an invoice.

§ 505.3 Fees for paper copying, duplicating, and reproduction of materials in library collections.

(a) Photocopy reproduction of paper copy will be set as a flat fee of $13.00 for domestic requests and $16.00 for international requests for each document requested with a maximum of 50 pages per article for copyright compliance. Materials delivered to international addresses via the Internet will be charged at the domestic rate. Photocopy reproduction of paper copy that requires special handling due to size or condition will incur special handling fees to recover costs at $20.00 per half hour or fraction thereof.

(b) Paper copies of microfilm or microfiche will be produced at a flat fee of $13.00 for requests delivered domestically and $16.00 for requests requiring delivery to a international address. This charge is for each document requested with a maximum of 50 pages per article for copyright compliance.

(c) Duplication of NAL owned microfiche will be charged a flat fee of $13.00 per each 5 microfiche duplicated or fraction thereof. Duplication of NAL owned microfilm will be charged a flat fee of $20.00 for each reel produced.

(d) Photographic services from NAL Special Collections will be charged at cost for reproduction of the photo product (slides, transparencies, etc.) plus a preparation fee of $25.00 per half hour or fraction thereof.

(e) All services in this section will incur a billing surcharge, currently $10.00, per invoice generated in addition to the above fees. This fee is a direct cost recovery based on charges to the library by the billing vendor and is subject to change. Interlibrary loan requests submitted by participants in the IFM program on OCLC will not incur the billing surcharge as their activities will not generate an invoice.

§ 505.4 Reserved.

§ 505.5 Reserved.

§ 505.6 Payment of fees.

Charges which include billing and handling will be invoiced quarterly by the National Technical Information Service (NTIS) of the United States Department of Commerce. The NAL encourages users to establish deposit accounts with NTIS. Payment for services will be made by check, money order or credit card in U.S. funds directly to the NTIS upon receipt of invoice from NTIS. Subject to a reduction for the actual costs of performing the invoicing service by NTIS, all funds received will be returned to NAL for credit to the appropriations account charged with the cost of processing the loan or copying request.

Done at Washington, D.C.

Edward B. Knipling,

Acting Administrator, Agricultural Research Service.

[FR Doc. 00-2875 Filed 2-9-00; 8:45 am]

BILLING CODE 3410-03-P

DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service

7 CFR Part 985

[Docket No. FV00-985-3 IFR]

Marketing Order Regulating the Handling of Spearmint Oil Produced in the Far West; Revision of the Salable Quantity and Allotment Percentage for Class 3 (Native) Spearmint Oil for the 1999-2000 Marketing Year

AGENCY: Agricultural Marketing Service, USDA.

ACTION: Interim final rule with request for comments.

SUMMARY: This rule increases the quantity of Class 3 (Native) spearmint oil produced in the Far West that handlers may purchase from, or handle for, producers during the 1999-2000 marketing year. This interim final rule increases the Native spearmint oil salable quantity by 102,311 pounds from 1,125,755 pounds to 1,228,066 pounds, and the allotment percentage by 5 percent from 55 percent to 60 percent. The Spearmint Oil Administrative Committee (Committee), the agency responsible for local administration of the marketing order for spearmint oil produced in the Far West, recommended this rule to avoid extreme fluctuations in supplies and prices and thus help to maintain stability in the Far West spearmint oil market.

DATES: Effective on February 11, 2000 through May 31, 2000; comments received by April 10, 2000 will be considered prior to issuance of a final rule.

ADDRESSES: Interested persons are invited to submit written comments concerning this rule. Comments must be sent to the Docket Clerk, Fruit and Vegetable Programs, AMS, USDA, room 2525-S, P.O. Box 96456, Washington, DC 20090-6456; Fax: (202) 720-5698, or E-mail: moab.docketclerk@usda.gov. All comments should reference the docket number and the date and page number of this issue of the Federal Register and

Mr. Skeen: Your fiscal year 2001 budget request does not appear to include any anticipated revenues from this proposal. What are your plans for fiscal year 2001?

Response: NAL anticipates revenues in 2001 of approximately $50,000 based on fiscal year 1999 usage. The revenues will be used to offset the costs of supplies and equipment used to provide the service.

Mr. Skeen: For the record, please update and provide a table similar to the one that appears on page 702 of last year's hearing record.

Response: An updated table of NAL Document Delivery Services Activity and cost is provided for the record.
[The information follows:]

NAL DOCUMENT DELIVERY SERVICE ACTIVITY AND COST

	1995	1996	1997	1998	1999	2000 *Estimate*
Requests Received	195,891	193,619	165,577	166,666	159,099	149,553
Total Requests Filled	168,619	167,648	145,347	143,409	114,551	107,678
Requests Filled from NAL Collection	156,618	154,314	130,455	125,032	99,659	93,680
Amount Spent (Millions)	$2.3	$2.3	$2.0	$2.1	$2.1	2.1
Amount Recovered (Millions)	$.012	$.010	$.010	$.007	$.010	.025

Mr. Skeen: Your fiscal year 2001 budget proposes a $2 million increase for enhanced information services in rural America by providing grants of $200-$500 thousand to individual land grant universities with 80 percent of the funding request. By our calculation, this means that only 3-8 universities would likely participate in these grants. How much are you likely to accomplish under this funding scenario?

Response: The President's fiscal year 2001 budget includes $2 million for the National Agricultural Library to enhance public access to agricultural research information. The proposal specifies that: $1,200,000 will be used to license and provide access to electronic resources; acquire and maintain agricultural information published in print format; pay copyright and usage fees incurred for borrowing or purchasing books and journal articles for USDA users; $600,000 will be used to upgrade and improve NAL's technology infrastructure to enhance our ability to provide access to the increasing amount of agricultural information in electronic formats; and, $200,000 will be used to develop a long-term strategy to preserve USDA digital publications to avoid the irrevocable loss of the Department's electronic information.

Mr. Skeen: What other funding sources are available to rural communities for similar purposes?

Response: There are no other funding sources available to rural communities for similar purposes at NAL.

LIBRARY OBJECT CLASS TABLE

Mr. Skeen: For the record please provide an object class table for fiscal years 1999, 2000, and 2001 for the Library.

Response: The object class table for the National Agricultural Library is provided for the record.

[The information follows:]

	Object Classification	FY 1999 Actual	FY 2000 Appropriation	FY 2001 Budget Estimate
	Personnel Compensation			
11.1	Permanent Positions	$8,371,000	$9,043,000	$9,245,000
11.3	Positions other than permanent	176,000	170,000	175,000
11.5	Other personnel compensation	114,000	64,000	66,000
	Total, Personnel Compensation	8,661,000	9,277,000	9,486,000
12.0	Personnel benefits: civilian retirement	1,812,000	1,830,000	1,897,000
	Total, Object Classes 11-13	10,473,000	11,107,000	11,383,000
	Other Obligations			
21.0	Travel and transportation	109,000	100,000	100,000
22.0	Transportation of things	106,000	110,000	110,000
23.3	Comm., util, other rents	669,000	670,000	680,000
24.0	Printing and reproduction	142,000	100,000	100,000
25.2	Other services	1,629,000	1,300,000	1,829,000
25.3	Purchases of goods and services	1,259,000	1,003,000	1,000,000
25.4	Operations & maintenance of facil	2,965,000	1,700,000	1,800,000
25.7	Operations & maintenance of equip	108,000	100,000	150,000
26.0	Supplies & materials	357,000	570,000	600,000
31.0	Equipment	3,263,000	2,490,000	3,500,000
41.0	Grants, subsidies & contributions	866,000	800,000	1,000,000
	Subtotal, All Other	11,473,000	8,943,000	10,869,000
	Total	21,946,000	20,050,000	22,252,000

LIBRARY CHANGES AND USAGE

Mr. Skeen: Please describe any recent changes at the library and usage during the last year.

Response: The renovation of the public services reading room areas necessitated the establishment of a temporary reading room for on-site patrons and a shifting of collections and staff while construction was underway.

Mr. Skeen: Please update the tables that appear on pages 704 and 705 of last year's hearing record.

[The information follows:]

INFORMATION CENTERS

Resources in Support of Specialized Subject Areas - FY 2000 Estimates

Information Center	General Purpose	Appropriated Funds	Reimbursable Funds	Total	Staff Years
Alternative Farming Systems	Supports agriculturalists interested in lessening the impact of farming On the environment. Includes Aquaculture information.	$ 302,188	$ 243,706	$ 545,894	1.5
Animal Welfare	A focal point for those interested in obtaining information on domestic and laboratory animal welfare.	688,924	-0-	688,924	3.0
Food and Nutrition	Maintains and monitors current data on healthy diet and nutrition for all sectors of U.S. society	892,539[1]	1,162,457	2,054,996	3.5
Rural	Provides information and referral services to local governments and communities to revitalize rural communities.	299,938	475,000	774,938	3.0
Technology Transfer	Assists in getting research results into the hands of those who can put it to practical use.	213,767	-0-	213,767	1.0
Water Quality	Monitors and maintains information on farming's effects on U.S. water supplies.	196,412	-0-	196,412	1.0
	TOTALS	2,593,768	1,881,163	4,474,931	13.0

[1]Includes $200,000 for the Food Safety Research Information Office.

Resources in Support of Specialized Subject Areas - FY 1999

Information Center	General Purpose	Appropriated Funds	Reimbursable Funds	Total	Staff Years
Agricultural Trade & Marketing	Provides information that aids U.S. agribusiness in remaining competitive in the international marketplace.	$ 29,262[1]	$-0-	$ 29,262	.25
Alternative Farming Systems	Supports agriculturalists interested in lessening the impact of farming Aquaculture information.	281,897	243,706	525,603	1.5
Animal Welfare	A focal point for those interested in obtaining information on domestic and laboratory animal welfare.	652,926	-0-	652,926	3.0
Food and Nutrition	Maintains & monitors current data on healthy diet and nutrition for all sectors of U.S. society	884,937[2]	1,182,457	2,067,394	2.0
Rural	Provides information & referral services to local governments and communities to revitalize rural communities.	342,865	475,000	817,865	2.5
Technology Transfer	Assists in getting research results into the hands of those who can put it to practical use.	211,654	-0-	211,654	1.0
Water Quality	Monitors and maintains information on farming's effects on U.S. water supplies.	206,854	-0-	206,854	1.0
Plant Genome	Supports the information and data management needs for the USDA Plant Genome Research Program.	146,641[3]	-0-	146,641	3.0
	TOTALS	2,757,036	1,901,163	4,658,199	14.25

[1]Beginning in January 1999, the Agricultural Trade & Marketing Information Center ceased operation. General reference services and activities have been integrated into NAL's public and technical services programs.

[2]Includes $200,000 for the Food Safety Research Information Office.

[3]These funds are appropriated to the Agricultural Research Service and transferred to NAL. During fiscal year 1999 the Plant Genome Informatics Program at NAL is being redirected to Cornell University. Salary reimbursements are being provided during the program transition.

NAL REPAIR AND MAINTENANCE

Mr. Skeen: Please provide a list of all repair and maintenance activities anticipated in fiscal year 2000.

[The information follows:]

Project	Amount
Clean Air Ducts	$150,000
Plumbing Repairs	$100,000
Phase 1 Electrical Construction	$392,000
Electrical Design	$163,000
Miscellaneous/Emergency Repairs	$ 95,000
Total	$900,000

Mr. Skeen: What is the backlog of maintenance repair work at the National Agriculture Library?

Response: The backlog of maintenance repair work at NAL is estimated to cost $24.9 million.

HUMAN NUTRITION RESEARCH

Mr. Skeen: The budget request includes an increase of $17,250,000 for research in support of Phase 3 of the President's Human Nutrition Research Initiative. Please provide an object class breakdown of how this increase would be spent.

Response: The object class breakdown for the human nutrition research increase will be provided for the record.

[The information follows:]

		Total
Personnel Compensation		
11.0	Personnel compensation	1,731,000
12.0	Personnel benefits: Civilian Retirement	396,000
	Total Personnel Compensation & Benefits	2,127,000
Other Services:		
21.0	Travel and transportation	309,000
23.0	Rent, communications, utilities	566,000
24.0	Printing and reproduction	22,000
25.0	Other Services	12,247,000
26.0	Supplies and materials	1,175,000
31.0	Equipment	804,000
	Total, All Other	15,123,000
Total, ALL OBLIGATIONS		17,250,000

Mr. Skeen: Please update the table that appears on page 708 of last year's hearing record showing the funding requirements and timeline of the Human Nutrition Research Initiative.

Response: The funding requirements and a time line to illustrate the entire scope of the Human Nutrition Research Initiative will be provided for the record.

[The information follows:]

AGRICULTURAL RESEARCH SERVICE
HUMAN NUTRITION INITIATIVE
5-YEAR FUNDING
($ in Thousands)

	FY 1998 (Actual)	FY 1999 (Actual)	FY 2000 (Actual)	FY 2001 (Est)	FY 2002 (Est)
Beltsville Human Nutrition Research Center (BHNRC)	$250	$ 500	$1,000	$5,400	$14,000
Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA)	250	500	1,000	2,900	6,000
Children's Nutrition Research Center (CHNRC)	500	1,000	1,500	4,350	9,000
Grand Forks Human Nutrition Research Center (GFHNRC)	250	500	1,000	2,600	4,900
Western Human Nutrition Research Center (WHNRC)	250	500	1,000	3,100	6,500
Arkansas Children's Hospital Research Inst.	1,000	1,750	2,250	6,250	12,600
Total	2,500	4,750	7,750	24,600	53,000

CANOLA RESEARCH

Mr. Skeen: Please update the Committee on the work you are doing and the 1999 accomplishments made in connection with canola research, by location.

Response: ARS research at Peoria, Illinois, has evaluated the effects of fatty acid modification on triglyceride structure of canola oil and on the amounts and types of bioactive constituents, such as sterols and tocopherols.

Mr. Skeen: By location, what is the funding and staff for canola research for fiscal years 1999, 2000, and 2001?

Response: ARS conducts canola research at Peoria, Illinois, with 0.6 scientists assigned to this work. Funding was $144,800 in fiscal year 1999, $138,600 in fiscal year 2000, and is expected to be $138,600 in fiscal year 2001.

CUSTOMERS / CLIENTS / STAKEHOLDERS

Mr. Skeen: Please submit for the record a listing of the ARS customers / clients / stakeholders.

Response: The ARS customer and stakeholder list is a dynamic list that changes as we add, delete, or revise names and addresses. The full list was last used for a mailing in November 1999, notifying ARS customers of recent developments in implementing the National Programs, especially the availability of the new National Program Annual Reports. The attached list is the most current version available.

[The information follows:]

Mr. Bruce Abbe

Dr. Marilyn Abbott
Corporate R&D Anheuser Busch

Mr. Don Abernethy
President, NCASWCD

Ms. Christine Adams, Manager
San Francisco Farmer's Market

Mr. John Adams
National Milk Producers Federation

Mr. Fred Adams, Jr.
Cal-Maine Foods, Inc.

Mr. Henry A. Affeldt, Chief Engineer
Sunkist Growers Inc, Res. Oper. Ctr

Agricultural Research Institute
Bethesda, MD

Dr. Nell Ahl, Director
USDA, Office of Risk Assessment &
Cost-Benefit Analysis

Ms. Susan Ajeska
TransFresh Corp

Ms. Elaine Albright
University of Maine

Dr. Jeffrey R. Aldrich, Res Biochem.
Insect Chemical Ecology Lab, ARS

Ms. Martha Alexander
University of Missouri Columbia

Dr. Randall Alford, Chair
University of Maine

Dr. Arthur L. Allen
Univ of Maryland Eastern Shore

Mr. C. Eugene Allen
Univ of Minn Agricultural Experi Stat

Mr. J. R. Allen, Director
Ag Exper Sta, Univ Dist. of Columbia

American Institute of Nutrition
Bethesda, MD

Mr. David Alnwick
Nutrition Section, UNICEF

Dr. Jose M. Amador, Ctr Dir
TX A&M Agricultural Res & Ext Ctr.

Mr. Dean Anderson
Agriculture Dept, Foss Building, SD

Dr. Don Anderson
North Dakota State University

Dr. John F. Anderson
Agricultural Experiment Station, CT

Mr. Steve Anderson, Area Manager
Burns District, Bureau Land Mgmt, OR

Mr. Rick Andrews
EcoScience Inc.

Mr. Russell Angell
Brantley Farms

Mr. J. Scott Angle
University of Maryland

Dr. Hector Rojo Arias
CIDESON

Mr. Gerald F. Arkin
Agricultural Experiment Station, GA

Mrs. Jessie B. Arnold
Alcorn State University

Dr. Richard W. Arnold
Natural Resources Conservation Serv

Mr. Michael Astrue
Biogen Inc

Ms. Rosemary Austin
Blackfeet Community College

Mr. Robert V. Avant, Jr, Exec Dir
Texas Food & Fiber Commission

Ms. Rebekah Zablud Azen
Fond du Lac Tribal

Mr. Charles W. Baker
The Sugar Association, Inc.

Ms. Nancy L. Baker
Washington State Univ

Ms. Quincee Baker, Librarian
Fort Berthold Community College

Mr. Steve Balas, Chairman
TX Rice Producers Legislative Grp

Ms. Charlene M. Baldwin
University of California

Mr. Randy Baldwin
Livestock and Poultry Sci Inst
Beltsville, MD

Dr. Pedro Barbosa, Professor
University of Maryland

Mr. Phillip Barbour
Riverside Plantation, MS

Mr. Robert Barnes, Exec Dir
American Society of Agronomy

Dr. Ata A. G. Baroud
The Vons Cos, Q.A. & Compliance

Dr. Ann Barrett, Food Engineer
U.S. Army Natick, Massachusetts

Mr. Jerry Barton

Mr. John Barton
Stanford Law School
Stanford University

Mr. Jim Basaraba
N.D. Weed Control Association

Mr. Ted Batkin
CA Citrus Research Board

Mr. Billy R. Baumgardt
Agricultural Research Programs
Purdue University, 1140 AGAD

Dr. Terry Beals, State Veterinarian
Texas Animal Health Commission

Dr. Charles Beard, Vice Pres
US Poultry & Egg Assoc Res & Tech

Dr. John L. Beard, Nutrition Program
Pennsylvania State University

Mr. John Becherer
CEO United Soybean Board

Dr. John R. Bedbrook
DNA Plant Technology Corp, CA

Mr. Ted Bederus

Mr. John W. Beecher
ND State University

Mr. J. H. Beeghly
DRAVO Lime Co.

Dr. G. Marvin Beeman, Veterinarian
Littleton Large Animal Clinic, PC

Dr. Gint Behrens
Land O'Lakes Inc.

Ms. Sara Belden
Renewable Fuels Association

Mr. Harry S. Bell, President
SC Farm Bureau Federation

Dr. Kenneth W. Bell, Res Dir
School of Agric, Natural Resources
DE State Univ

Mr. Richard Bell, President
Riceland Foods, Inc.

Dr. Ronald Belyea, Professor
Animal Sci Dept, Univ MO, Columbia

Mr. Richard A. Bendis, President
Kansas Technology Enterprise Corp

Mr. Parshotam S. Benepal, Assoc Dir
Agricultural Research Stn
VA State Univ

Mr. Doug Benevento, Majority Dir
House Agriculture Subcommittee on
Resource Conservation, Research &
Forestry

Mr. Al Bennett
US Army Natick Labs, STRNC-WTP

Dr. Harold R. Benson, Res Dir
Kentucky State University

Mr. Tim Bernardis
Little Big Horn College

Ms. Rebecca Bernthal
Univ of Nebraska, East Campus
Thompson Library

Dr. Deepak Bhatnagar
Commodity Safety Research Unit
Southern Regional Research Ctr, LA

Dr. Yildiz B. Binkley
Brown-Daniel Lib, TN State Univ

Dr. Elizabeth Bird
University of Wisconsin-Madison

Mr. Hans P. Blaschek
Dept Food Science, Univ of Illinois

Ms. Deborah Blum
Sacramento Bee

Dr. Jeffrey Blumberg, Assoc Ctr Dir
Jean Mayer Human Nutrition Research
Center On Aging at Tufts, MA

Mr. E. Michael Blumenthal
PA Dept of Conservation & Enviro Res

Dr. Janos Bodor, Manager
Van den Bergh Foods Co

Capt. Herbert T. Bolton, US Navy
Armed Forces Pest Management Bd
Forest Glen Section, WRAMC

Mr. Darrell Bolz, Chairman
Northwestern Alfalfa Seed Growers
Assoc

Dr. Kenneth A. Boni, Chairman
American Leather Chemists Assoc
(ALCA)

Mr. Elliott Booth
SW Indian Agricultural Assoc., AZ

Mr. Mark Borba

Dr. Larry Borchert
Oscar Mayer Foods

Mr. Jim Bostic
WV Cattlemen's Association

Mr. Daniel A. Botts, Manager
Florida Fruits and Vegetable Assoc

Mr. Douglas Bournique
Indian River Citrus League

Mr. Kenneth W. Boyer
Southern Testing and Res Labs, Inc

Mr. Joseph F. Boykin, Jr.
Clemson University

Dr. Clifford Bradley, Vice Pres
Mycotech Corp.

Mr. Philip E. Bradshaw
USDA, APHIS IL

Ms. Patsy Brannon
University of Maryland

Mr. Dan Branton
Chairman, Delta Council
Advisory Research Committee, MS

Ms. Ellis Brenton
Tyson Foods

Dr. Jerome J. Breiter, Pres
US Hide, Skin and Leather Assoc
Div of American Meat Inst, VA

Dr. Richard E. Breitmeyer
Director & State Veterinarian
Dept Food & Agriculture, CA

Dr. J. Grant Brewen, Pres and CEO
Biotechnology Res & Develp Corp, IL

Mr. Bruce A. Briggs
Briggs Nursery

Mr. George Briggs, Pres
Amer Assoc Botanic Gardens
North Carolina Arboretum

Ms. Marilyn Briggs
Deptarment of Education
Task Force CA Nutrition Policy

Dr. Steve P. Briggs
President, Novartis Agricultural
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National Gypsy Moth Management Bd
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USDA, ARS, NAA
Appalachian Fruit Res Stat, WV

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Cargill Inc., Corn Milling Division

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Far East Trade Service

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Dept. of Plant Pathology
Cook College

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Soil Science Society of America, WI

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NOVO Nordisk Biotech, Inc.
Davis, CA

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Biological Control Laboratory
NJ Dept of Agriculture

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Rangeland Ecosystem Science
CO State Univ College of Natural Resources

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Society of Nematologists
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University of Maine

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Monsanto Inc, Nutra-Sween Company

Neville Clarke
Centeq Research Plaza, #241
Texas A & M University System

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American Dry Milk Institute

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Virginia State University

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Cornell University

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American Meat Institute

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MD Dept Agric, Allegheny Soil Cons Dist

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Leather Industries of America Inc
LIA Research Lab. Univ of Cincinnati

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OK Ag Exper Stat, OK State University

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N American Strawberry Growers Assoc

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International Apple Institute

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American Pomological Society
Penn State Univ

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Rich Products Corp.

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Ocean Spray Cranberries, Inc.

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Natural Resources Conservation Ser

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Washington State University
Institute of Biological Chemistry

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Robert F. Kennedy Memorial Lib
University of Guam, UOG Stat

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New Mexico State University

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Plant Protection & Quarantine, USDA-APHIS

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Texas Tech University

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Dahl Land and Cattle Company

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Southeastern Poultry and Egg Assoc

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Dept of Geography and Geology
Indiana State University

National Barley Improvement
Committee, WI

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NY State Dept Agriculture & Markets

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University of Florida

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Delaware Cooperative Extension

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Dean and Dir of Agriculture
Alcorn State University

American Malting Barley Assn.
Milwaukee, WI

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Ohio State Univ, Dept Food Sci & Tech

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W Natl Tech Ctr., Nat Resource Conser
Serv, OR

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Monsanto, Agriculture Group

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PRAXIS

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Research, Develp & Engineering
Pepsico Inc.

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Little Hoop Community College

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General Counsel, Nature Conservancy

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Univ of Puerto Rico
Mayaguez Campus

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Agricultural Affairs, Monsanto Co

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NC Dept of Agriculture

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School of Agriculture
Chico State University

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Past Pres, American Soybean Assoc

Dr. Robert F. Dietrick
Specialty Products Div.

Dr. Douglas DiRienzo
Dairy Mgmt. Inc.

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Wallace Tech Transfer Found of Iowa

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Department of Entomology
University of Maryland

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Natl Academy of Sciences, Inst of
Botany & Phytointroduction, Kazakstan

U.S. Bureau of Reclamation
Boise, ID

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American Assoc of Nurserymen

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NY State Horticultural Society
Cornell Univ

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Early Childhood Res Ctr.
University of Maryland Eastern Shore

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Univ Park, Southern Illinois

Ms. Ann M. Donoghue
Livestock and Poultry Sci Inst, MD

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Western Reg, Canadian Dept Agriculture
Ottawa, Ontario, Canada

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WV Dept. Of Agriculture

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International Association of Milk Food, & Environmental Sanitarians, IA

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University of Alaska Fairbanks

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Rodale Institute Research Center

Ms. Carol A. Drum, Chair
Univ of Florida, Marston Sci Lib

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Defense Research Technologies

Dr. Jesse Dubin, Plant Pathologist
CIMMYT, Lisboa 27 Apdo, Mexico D.F.

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Florida Sugan Cane League

Mr. Phil Dukas
National Dairy Herd Improvement Assoc

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R & D, Hershey Foods Coop

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Dept. Crop & Soil Sciences, GA

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VP Research, FL Sugar Cane League

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Membership & Communications
U.S. Feed Grains Council

Dr. Thayne R. Dutson
Ag Exp Stat, Strand Agr. Hall 138
Oregon State University

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Pioneer Hi-Bred, Inc

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Soil, Crop and Atmospheric Sciences
Cornell University

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Plant Breeding Dept.
Cornell University

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WI-Madison Schl of Veterinary Medicine

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Iowa State University

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Leather Res Inst, Texas Tech Univ

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Wool Bureau, US Br Intl Wool Secretariat

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Dept Ag Engineering, Univ of Illinois

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Technical Operations, Sandoz Nutrition

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MS Soybean Association

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Director, Agricultural Research and Biotechnology
Lipton
Stockton, CA

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California Citrus Quality Council

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Industrial Development Commission, AR

Ms. Eva English
Fort Belknap College Lib

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Hydrological Sciences Branch
NASA/GSFC

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Research & Turkey Nutrition

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American Corn Millers Fed

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Oklahoma Department of Commerce

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Amer Soc for Nutritional Sciences
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Agricultural Experiment Station
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Dept Nutrition, Harvard Schl Public Health

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FENN Products

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USDA-ARS-BA, National Museum

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Cornell University

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School of Public Health, Univ of
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Maine Farmers Exchange

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GPRA Project Leader
Office of Management & Budget

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Dept Biological & Environmental Sci
California University of Pennsylvania

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Senior Research Scientist
Cargill
Minneapolis, MN

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Dept Entomology, NC State Univ

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Insect Pathology, Dept of Entomology
Cornell University

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University of Nebraska - Lincoln

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c/o Entomology Dept, NC State Univ

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Human Nutrition Institute
International Life Sciences Inst.

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Mississippi State Univ

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College Agr. and Life Sci. Dir.
Texas Ag. Ex. Svc., Texas A&M Univ

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USDA, NRCS
WV Grazing Lands Steering Committee

Mr. Jimmy L. Hill
Georgia Power
Agribusiness Development Div.

Dr. N. S. Hill
Dept Crop & Soil Sciences
Miller Plant Sci Bldg, UGA

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Hazleton

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Dean and Director of Agriculture
Tuskegee University

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Department of Animal Science
Cornell University

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University Libraries
VA Polytechnic Inst and State Univ

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Kansas State University

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Department of Entomology
Cornell University

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Ag Exp Stat, Pennsylvania State
University

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Hagelin & Co., Inc.

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University of Wyoming

Mr. Bernard Horton
Norton International Inc.

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Department of Entomology
Pennsylvania State University

Mr. Harlan Howes

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American Home Products Corp.
Wyeth Nutritionals Inc

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NIDDK, NIH

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Botany and Plant Pathology
Purdue University

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World Wildlife Fund

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Grand Forks Human Nutrition Res Ctr.
Univ of ND

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Regional Poultry Research Lab, MI

Mr. James E. Hunter, Dir
Agricultural Experiment Station
Cornell University

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Consulting Veterinarian and Ass.
Professor, Florida A&M University

Dr. David Hurt
Kansas State University
Kansas Value Added Center

Mr. David H. Hurt
National Livestock & Meat Board, IL

Mr. Verner G. Hurt, Dir
Mississippi State University
Agricultural and Forestry Exper Stat

Mr. Joseph Ingerson-Mahar
Area Ext Ag, IPM Unit
Rutgers Cooperative Extension

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Mississippi Livestock Council

Dr. Nancy Irelan
E. & J. Gallo Winery, CA

Mr. Roger Isom
California Cotton Ginners and
Cotton Growers Associations

Masa Iwanaga
IPGRI, ITALY

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OPTA Food Ingredients, Inc.

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Textile Research Institute (TRI), NJ

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USA Rice Federation

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Dept of Science and Technology
Auburn Univ Libaries

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Miller F. Whitaker Lib, SC State Univ

Mr. Kenlon Johannes
National Biodiesel Board, MO

Mr. Carl Johnson
American Dairy Science Assn., IL

Dr. Edward R. Johnson
Oklahoma State University

Mr. H. K. Johnson
American Meat Science Assoc
c/o National Livestock & Meat Bd, IL

Dr. Lawrence A. Johnson, Professor
Iowa State University
Ctr for Crops Utilization Research

Dr. Marc Johnson, Dean-Dir
Kansas State University

Dr. Mark E. Johnson
Wisconsin Center for Dairy Research
University of Wisconsin

Ms. Phyllis Johnson
Michigan Technological Univ

Mr. Seymour Johnson

Dr. Charlotte Johnson-Welch
International Ctr for Res on Women

Mr. Rob Johnston
Johnny's Selected Seeds, ME

Mr. Bernard M. Jones
University of Nevada Reno
Agricultural Experiment Station 221

Mr. Doug Jones
Science/Engineering Library
Univ of Arizona

Dr. Lynn A. Jones
Natl Cottonseed Products Assoc, TN

Dr. Andrew G. Jordan
Natl Cotton Council of America, TN

Dr. Karen R. Jordan, Veterinarian

Mr. Robert R. Jorgensen, Dir
American Veterinary Medical Assoc

Dr. G. L. Jubb
Va Agriculture Experiment Station
Va Polytechnic Inst and State Univ

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American Society Horticultural Sci, VA

Mr. Noel P. Kafford
University of Hawaii at Manoa

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College Agriculture
Dir Arizona Ag Experiment Station
Univ of Arizona

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General Lamar Harrison Lib
Langston University

Mr. Dean Kanode

Dr. Indulis Kanutis
Dairy Div, USDA, FSA

Dr. Ira Katz
IFFR&D, NJ

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University of Tennessee

D. R. Keeney
Leopold Center, Iowa State Univ

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Agriculture and Natural Resources

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Allied Signal Inc., MO

Ms. Sarah A. Kelly
Purdue University

Ann Kennedy
Washington State Univ

Dr. K. M. Kerr
Ag Exp Stat, Univ of Connecticut

Steve Kerr
Holstein Association, VT

Mr. Edwin Ketchum
So W. Animal Health Research Fnd, OK

Mrs. Mary P. Key
Librarian, Agriculture Library
Ohio State University

Mr. H. G. Kim, Korean Consul
Agricultural Attache

Mr. Frank Kinney, Exec Dir
Technological Research and
Development Authority, FL

Mr. Richard Kinney, Exec VP
Florida Citrus Packers

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Agronomic Development Ctr, IL
BASF Corp

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Campbell Soup Company

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AK Pharma Inc, NJ

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Iowa State University

Dr. Spangler Klopp, President
Corporate Veterinarian
Townsends, Inc., DE

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CALGENE Company

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Associate Provost for Agriculture
Colorado State Univ

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Dir, University Library
University of Connecticut

Ms. Norma Kobzina, Librarian
Biosicence and Natural Resources Lib
University of California, Berkeley

Mr. Daniel Kochaki
Manager of Discovery and Development
Thomas J. Lipton Company

Mr. Tom Kourlis
Colorado Commissioner of Agriculture

Mr. Jerome J. Kozak, VP
International Dairy Foods Assn

Dr. Richard Kramer, Director
Research, Education, & Technical Resources
National Pest Control Association, VA

Dr. Steven Krause
State Gypsy Moth Program Coord
WI Department of Agriculture

Dr. Terry L. Kristensen
Director of Client Services
The CBORD Group, Inc.

Dr. G. J. Kriz
Assoc Dir. Agr. Res. Svc.
North Carolina State University

Mr. Charles Krueger, Assoc Dean
PA Agric. Exp. Station
Penn State University

Mr. Fred Krupp, Exec Dir
Environmental Defense Fund, NY

Ms. Ann Krush
Sinte Gleska Univ, SD

Mr. David Kryder
Pioneer Hi-Bred International, Inc
Research and Product Development

Mr. Edward A. Kurtz, Manager
Iceberg Lettuce Advisory Board

Dr. Robert T. Lackey, Deputy Dir
Environmental Research Laboratory
U.S. Environmental Protection Agency

Mr. William B. Lacy, Director
University Cooperative Extension
Cornell University

Mr. William Lalor
Cotton Incorporated

Mr. Leslie F. Lamb
Milk Marketing Board

Ms. Edith Landau
Navajo Community College, AZ

Mr. Bill Landesman
Rodale Institute

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Centre for Plant Health
Canada

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Hoarde's Dairyman

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World Resources Inst

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Dept of Entomology
Rutgers University

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Colorado State University
Agricultural Experiment Station

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Maine Potato Board

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William Robertson Coe Lib
University of Wyoming

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Waterford Farms

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University of Guam, UOG Station
College of Agriculture and Life Sci

Dr. Eng Hong Lee
Vetech Laboratories
Ontario, Canada

Mr. Gary A. Lee
University of Idaho
Agricultural Experiment Stat

Dr. Hyunok Lee
Dept of Agricultural Economics
Agricultural Experimental Stn, CA

Ms. Susan Lee
Perdue Farms Incorporated

Ms. Susy S. Lee
DNA Plant Technology Corp

Mr. Thomas Leidy, President
Leidy's Inc. Pork Products

Dr. Mary B. Leininger
American Vet Med Assoc

Dr. Jerry Lemunyon, Agronomist
USDA-NRCS
South National Technical Ctr, TX

Prof. Robert W. Lenz
Dept Polymer Sci and Engineering
Univ of Massachusetts at Amherst

Mr. Norman C. Leppla, Assoc Dir
National Biological Control Inst
USDA-APHIS, MD

Dr. H. L. Lewis
Scientific Seed Company

Mr. Joe Lewis
Insect Biology and Population
Management Research Lab, GA

Mr. Rick Lewton

Mr. Dee Likes, Exec V Pres
Kansas Livestock Association

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House Appropriations Committee

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WV Association for Cave Studies

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University of Idaho
Agricultural Experiment Station

Mr. Ira Linville
US Environmental Protection Agency

C. Oran Little, Dean-Dir
University of Kentucky
Agricultural Experiment Station

Nicanor Liquido
Tropical Fruit and Veg Res Lab

Dr. F. M. Loew, Dean
Tufts Univ School Veterinary Medicine

Dr. John E. Long, President
Res Div, Archer-Daniels-Midland, IL

Dr. Raymond Loretto, Veterinarian
Member, Natl Indian Cattlemen Assoc

Mr. Richard L. Lower, Exec Dir
Univ WI, Madison, Agr Exper Stat

Dr. Leon T. Lucas
NC Cooperative Extension Serv
NC State Univ

Mr. Robert Lucey, Prof Emeritus
Dept Soil, Crop & Atmospheric
Sciences
Cornell Univ

Ms. Arlene Luchsinger
Science Library
University of Georgia

Dr. Darryl Lund, Dir-Exec
Rutgers Univ Cook College
Agricultural Experiment Stat

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Cornell University

Mr. Lanny J. Lund, Dean-Assoc
University of California
College of Natural & Agricultura Sci

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Univ of California

Mr. James Lyon, Exec Dir
American Oil Chemists Society (AOCS)

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Maddux Cattle Company

Ms. Linda Maddux
University Libaries
VA Polytechnic Inst

Mr. Melvin Maier, Administrator
North Dakota Wheat Commission

Mr. Robert Mangari
Dept of Agriculture and Markets
Div of Plant Industry, NY

Mr. John B. Mannion
American Water Works Assoc

Mr. Jerry Marks, Chairman
Montana Weed Control Association

Mr. Steven Marquardt
ND State Seed Department
State University Station

Mr. Peter S. Martin, Field Ecologist
Delaware Wild Lands, Inc.

Dr. Rebecca R. Martin
Bailey/Howe Memorial Lib
University of Vermont

Dr. James J. Marshall

Dr. David C. Martens
Dept. Crop & Soil Environ. Sci.
VPI&SU, VA

Dr. Charles E. Mason, Assoc Prof
Dept Entomology and Applied Ecology
University of Delaware

Mr. Victor C. Mastro, Dir
Otis Methods Development Ctr
USDA-APHIS, MA

Mr. Jim Mattheis

Mr. Tom Matthison
Stemilt Growers

Mr. Erik Mattila
D-Q University, CA

Mr. A. Bruce Maunder, President
Crop Science Society of America, WI

Mr. William W. Mautz
University of New Hampshire
Agricultural Experiment Station

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Mississippi Poultry Assoc, Inc.

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Secy. Advisory Committee on FAD, CA

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American Crop Protection Assoc

Mr. Mark McCaslin
Forage Genetics, WI

Ms. Anna McClung
Rice Research, TX

Dr. Richard L. McConnell
Pioneer Hi-Bred International
Department of Corn Breeding

Dr. Tom McCoy, Dir
Agricultural Experiment Stat
Montana State Univ

Dr. Jacquelyn W. McCray, Dir
Univ of Arkansas at Pine Bluff

Ms. Karen McDaniel, Dir
Paul G. Blazer Library
Kentucky State University

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Worthington Foods Inc.

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Agricultural Experiment Station
Cornell Univ

Mr. Richard C. McDonald
Plant Industry Division
NC Dept Agriculture

Mr. Michael McDow, Act Dir
National Research Council
Office of International Affairs

Dr. G. N. McEwen, Jr., VP-Science
Cosmetic, Toiletry and Fragrance
Assoc

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Laurel Valley Plantation, Inc.

Ms. Tina McKinley, FLC Chair
Federal Laboratory Consortium
Oak Ridge Inst for Science & Educ, TN

Mr. Bobby McKown
Florida Citrus Mutual

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Resource Concepts, Inc.

Dr. Anne S. McLeod
Univ of Maryland at College Park

Mr. Robert G. McVicker, Sr V Pres
Tech Group and Kraft Food Ingredients
Kraft Food

Mr. David Meeker, VP Res and Educ
National Pork Producers Council

Dr. Haile Mehansho, Res Scientist
Proctor and Gamble Company
Miami Valley Laboratories

Dr. Margaret Meites
Office of Health and Nutrition
Bureau of Science & Technology, USAID

Mr. Charles J. Melancon
American Sugar Cane League, LA

Ms. Margaret G. Mellon
Union of Concerned Scientists

Mr. Donald Mennel
Mennell Milling Co

W. W. Metterhouse, Exec Dir
Interstate Pest Control Compact

Mr. Ron Micheli
Commissioner, State Dept. Ag., WY

Mr. Thomas Mick, Adm
Washington Wheat Commission

Mr. Alan Middaugh
Potato Council, CO

Dr. Jeffrey C. Miller, Prof
Entomology
Department of Entomology
Oregon State University

Mr. Jim Miller
National Association of
Wheat Growers

Mr. Norman Miller, Director
Agricultural Science Program
Milton Hershey School, PA

Dr. Robert H. Miller, Dir
Agricultural Experiment Station
University of Rhode Island

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Pennsylvania State University

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Agricultural Retailers Assoc, MO

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WA St. Univ, Natl Res Support Proj 5
Irrigated Agriculture Res and Ext Ctr

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House Committee on Agriculture

Mr. Jim Mitchell
Conservation Tech Information Ctr, IN

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AgriculturaL Experiment Station
University of Missouri-Columbia

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Mr. Ted Mollett
Univ of Maryland, Eastern Shore
Department of Animal Science

Dr. Harley Moon
Iowa State University
College of Veterinary Medicine

Dr. K. J. Moore
Dept. of Agronomy, Iowa State Univ

Dr. Claudia J. Morner
University of New Hampshire

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Bureau of Land Management, NV

Mr. E. M. Morgan, Exec VP
Delta Council, MS

Dr. David Morris, Vice Pres
Inst.for Local Self Reliance, MN

Mr. Bruce Morton
Montana State University Bozeman
Dean of Libraries

Dr. Peter Mosher
ME Dept of Agriculture, Food,
and Rural Resources, Deering Bldg

Dr. George Muck
Dean Foods Company

Mr. Mark Mueller
NW Regional Planning Commission, WI

Dr. John Mulhern
Ben Franklin Technology Center
of Southeastern Pennsylvania

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Elanco Animal Health, IN

Mr. Roger Muren
SunSeeds

Mr. Frederick A. Murphy, Dean-Dir
University of California
School of Veterinary Medicine

Center for Disease Control, MD

Mr. William Murphy, Professor
Dept. of Plant & Soil Science
Univ of Vermont

C. J. Mussinan, Sec/Treasurer
IFF R&D, NJ

Mr. Bob Mustell
Natl Corn Growers Association, MO

Ms. Martha Mutschler
Tomato Breeders Round Table
Cornell Univ

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Michigan Corn Growers Assoc
Corn Marketing Program of Michigan

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Leather Industries of America Inc

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Fertilizer Institute

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Department of Plant Pathology
Ohio State Univ

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Michigan Biotechnology Institute

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USDA, ARS, Civil Rights Staff

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United Egg Producers

Mr. Darrell W. Nelson, Dean-Dir
Univ NE, Agricultural Experiment Stat

Mr. David Nelson
Oregon Seed Council

Dr. Jerry Nelson, President
American Society of Agronomy
Dept. of Agronomy, Univ of Missouri

Mr. Henry Nesmith
Department of Social Science
Community College of Philadelphia

Mr. Victor Nettles, Chair
SECWDS, College Veterinary Medicine
University of Georgia

Mr. Tim Ng
Cucurbit Genetics Cooperative
Dept. of Horticulture, Univ Maryland

Dr. Buford L. Nichols
Baylor College of Medicine

Mr. James R. Nichols, Prog Coord
Greenbrier River Hydrologic Unit
WVU Extension Service

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University of Delaware

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PA Dept. of Environmental Resources

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Agricultural Research Consulting, CA

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CA Dairy Research Foundation

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American Farm Bureau Federation, IL

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Lincoln University

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V. Chancellor, Inst of Agriculture
University Of Nebraska

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USDA-NRCS, TX

Mr. Charles Onwulata
USDA, ARS, NAA
Eastern Regional Res Ctr

Dr. Susan E. Orosz, Assoc Prof
Univ Tenn College of Veterinary
Medicine

Dr. Frank T. Orthoefer, Vice Pres
Research and Development
Riceland Foods Inc

Mr. Eldon Ortman, Assoc Dir
Office of Agricultural Res Prog
Purdue University

Ms. Karen Oschwald
Marketing Generalist
Dept Agriculture, IL

Mr. Alan Oser, Dir Tech Serv
Hatfield Quality Meats

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Cattlemen's Association, OR

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National Association of Wheat
Growers Foundation

Dr. D. S. Padda, VP Research
University of the Virgin Islands

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Intl Ornamental Crabapple Society, KS

Dr. Sunil K. Pancholy, Res Dir
Florida A&M University

Mr. Alberto Pantoja, Dir
Agricultural Experiment Stat, PR

Dr. Alfred Parks, Res Dir
Prairie View A&M University

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Vocal Director, Division Agricola
Col San Rafael, Mexico

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Louisiana State University

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E205 Patee Library
Pennsylvania State Univ

Mr. John Paugh

Mr. Carl H. Payne
Oregon Cherry Growers Association

Mr. Thomas L. Payne, Director
Agricuultural Res and Develp Ctr
Ohio State University

Dr. Gary G. Pearl, Pres and Dir
Fats and Proteins Res Found Inc, IL

Mr. Jim Pearson
National Veterinary Serv Lab
USDA, APHIS, IA

Mr. Ralph Peck
Agriculture Department Director
Agriculture and Livestock Bldg, MT

Dr. G. A. Pederson, Sr Editor
American Forage & Grassland Council,
TX

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Iowa State Univ

Sinthya Penn
Beneficial Insectories, CA

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Community Library, WI

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Mycological Society of America
Harvard University

Dr. Ronald L. Phillips, Director
Plant Molecular Genetics Institute
University of Minnesota

Dr. Bobby R. Phills, Dean
Southern Univ and A&M College, LA

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Dean of Agriculture
University of Puerto Rico

Dr. Per Pinstrup-Andersen, Dir Gen
International Food Policy
Research Institute (IFPRI)

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Consumer's Union, NY

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Crownpoint Inst of Tech, MN

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Pennsylvania Dept of Commerce

Ms. Maria A. Porta
Agriculture Lib, Univ of Illinois

Mr. Paul Portney, Pres
Resources for the Future

Mr. Peter E. Poss
Poultry Industry, MN

Dr. Jonathon Pote, Director
Water Resources Institute
MS State Univ

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Ilah Dunlap Little Memorial Lib
University of Georgia

Ms. Delores Pourier
Oglala Lakota College
Learning Resources Center, SD

Mrs. Antoinette Paris Powell
Agriculture Library
University of Kentucky

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The Potato Association of America
University of Minnesota

Dr. E. C. Prigge
Div. Animal & Vet. Sci.
WV University

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Assoc of Soil Conservation Dist, ND

Dr. Kenneth F. Raffa, Prof of Forest
Department of Entomology
University of Wisconsin

Naseem Z. Rahim
Stone Child College Lib, MT

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Delaware Department of Agriculture

Dr. Clifford W. Randall, STAC
Chairman
Chesapeake Bay Research Consortium
VPI & SU, VA

Dr. Leon Raney
South Dakota State Univ

Ms. JoAnne M. Rantz
Amer Soc for Enology & Viticulture,
CA

Mr. H. Paul Rasmussen, Dir
Utah State University
Agricultural Experiment Station

Mr. Gordon C. Rausser, Dean-Dir
University of California
College of Natural Resources

E. B. Rayburn
Agricultural Sciences Bldg.
WVU Cooperative Extension Svce.

Ms. Susan E. Read
Canandaigua Wine Company, Inc., NY

Mr. Richard C. Reardon, Prog Man
Natl Ctr Forest Health Management
USDA Forest Service, WV

G. Redden
USDA, NRCS, Greenbrier Valley Soil
Conservation District, WV

Dr. G. B. Reddy
Dept. Natural Resources
NC A&T State Univ

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Frito-Lay, Inc, Res & Develp Div, TX

Mr. Don Reed
Reed's Seeds

Mr. Ray Reich
AG Business

Dr. Nathaniel W. Revis, Director
Oak Ridge Research Institute, TN

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American Sugar Cane League, LA

Mr. Don O. Richardson, Dean
University of Tennessee
Agricultural Experiment Station

Mr. Leo Richardson
Elanco Animal Health Res and Devlp,
IN

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Raleigh County Extension
WVU Extension

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New Holland North America, Inc.

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Farmland Industries, Inc

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Sci Lib, University of Michigan

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Maryland Dept of Agriculture

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Technical Svces, Perdue Farms, Inc.

Illinois Soybean Program
Operating Board

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Leech Lake Tribal College

Mr. William Robinson
American Casein Co.

Dr. Richard Rocco
Idetek Inc.

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American Sheep Industry Assoc

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Georgia Institute of Technology

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Roche Vitamins and Fine Chemicals

Dr. Irwin Rosenberg
Jean Mayer Human Nutrition Res
Center on Aging at Tufts Univ, MA

Mr. P. Frank Ross, President
AOAC International
USDA, NVSL, IA

Dr. Ray Rothenberger
Department of Horticulture
University of Missouri-Columbia

Mr. Bob Rucker
American Society for Nutritional Sciences
Dept of Nutrition, Univ of CA

Ms. Ashby P. Ruden
Horticultural Research Institute

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Ralph W. Steen Lib
Stephen F. Austin State Univ, TX

Mr. James Rutledge, VP
Lauhoff Grain Co.

Mid-America Dairymen, Inc.
Springfield, MO

Dr. Thomas W. Ryan III, Manager
SW Res Inst, Engine, Fuel & Veh Res Div, TX

Ms. Eileen Sadasiv
Research Office, Univ Rhode Island

Ms. Lutishoor Salisbury
Mullins Library
University of Arkansas

Mr. Mark Samson, Administrator
Idaho Wheat Commission

Ms. Rita K. Samuelson, Dir
American Wool Council
Div American Sheep Industry Assoc, CO

L. Sandvol, Ext Entomologist
Univ Idaho, S.E. Research and Extension Ctr

Silviero Sanirini
Intl Society Horticultural Science
Belgium

Mr. Antonia A. Santos, Dir
Northern Marianas College
Agric. Experiment Stn, Salpan, MMP

Mr. J. William Satterfield, Exec Dir
Delmarva Poultry Industry, Inc.

Dr. John C. Sawhill
The Nature Conservancy

Mr. Carl Scharfenberg
Yoder Brothers

Ms. Anita Scheetz
Fort Peck Community College, MT

Mr. Jay Schenck
PA Technology Assistance Program
Penn State Erie

Mr. Erich Schimps
Humboldt State Univ, CA

Christian Schlect, President
Northwest Horticultural Council, WA

Mr. Doug Schmale, Vice Pres
Nebraska Wheat Growers Assoc

Dr. Barbara Schneeman, Dean
College of Agricultural
and Environmental Sciences
University of California

Dr. A. A. Schneiter, Head
Department of Plant Sciences
North Dakota State University

Dr. Robert Schroder, Res Entomologist
Biological Control Lab
USDA-ARS, MD

Mr. Reid Schuller
High Desert Office of
the Nature Conservancy, OR

Mr. Charles P. Schwalbe
Regional Dir, USDA, APHIS, PPQ
Northeastern Regional Office, NJ

Mr. Allen Schwartz
Inst of American Indian Arts, NM

Mr. Thomas K. Schwartz
Beet Sugar Development Found, CO

Dr. Charles J. Scifres, Dean & Assoc VP
Dale Bumper College of Agricultural
Univ of Arkansas

Dr. Dharmawansa Senadhira
Rice Research and Extension Center
University of Arkansas

Dr. T. Sexton
Agricultural Experiment Station
University of Maryland

Mr. Alain Seznec
Cornell University

Mr. Phillip L. Shane, Mar Dev Dir
Illinois Corn Growers Assoc

Dr. W. Sharp
Agricultural Experiment Station
Rutgers University

Ms. Marilyn J. Sharrow
University Library
University of California-Davis

Mr. Ernest C. Shea
Natl Assoc of Conservation Dist

Marija Sheid

Mr. Jeffrey L. Shick, Deputy Dir
National Technology Transfer Ctr
Wheeling Jesuit College, WV

Ms. Kathleen Shields, Res Leader
Northeastern Forest Experiment Stat
USDA Forest Service, CT

Dr. Sharon P. Shoemaker, Exec Dir
Univ of California, Davis
College of Agricultural and
Environmental Sciences

Dr. James W. Shuford
Dean and Director of Agriculture
Alabama A&M University

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Chief, Rations System Div, SCSNC-WR
U.S. Army Soldiers System Command, MA

Mr. Tejinder Sibia
Shields Library
University of California

Dr. James N. Siedow, President
American Society Plant Physiologists
DCMB/Botany Dept, Duke University

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House Agr Subcommittee on Resource,
Conservation, Research and Forestry

Dr. Ocleris Simpson, Res Dir
Langston University

Mr. Don Sims

H. M. Singletary, President
National Plant Board
c/o N.C. Dept. Agriculture

Mr. Larry Sitzman, Dir Agriculture
Lincoln, NE

Dr. Virgil Smail
American Institute of Baking, KS

Mr. W. Robert Smallwood
Delaware Economic Development Off

Mr. Reid J. Smeda
Southern Weed Sci Lab, MS

Mr. David Smith
U.S. Geological Survey
Denver Federal Center

Jessie Smith, Dir
Frederick Douglass Library
University of Maryland-Eastern Shore

Mr. Jim Smith
National Pork Board

American Soybean Association, MO

Ms. Paula M. Smith
SW Indian Polytechnic Inst, NM

Ms. Nancy Socha, Manager
Technology Acquisition, DowElanco, IN

Mr. James Soehner

Southern Peidmont Conservation
Research Center

Mr. Ken Spence
WV State Farm Bureau

Mr. Duane R. Spomer, Chief
Dairy Standardization Branch
USDA, AMS, Dairy Division

K. Sponaugle
Teams Coordinator, USDA, NRCS, WV

Mr. Jim Squires

Mr. Evan Stadlman
Iowa Corn Growers Assoc

Dr. C. L. Staines, Jr.
MD Department of Agriculture
Plant Protection Section

Mr. Don Steinbeisser

Dr. Bruce Stillings
Chocolate Manufacturers Assn.
National Confectioners Assn, VA

Mr. Mark Stime, President
Eastern SD Soil and Water Farm

M. Stoetzel, President
Entomological Society of America, MD

Ms. Carla J. Stoffle, Dean
Univ of Arizona

Ms. Patricia Stolfa, Dep Adm
USDA, Food Safety and Inspection Serv

Dr. William F. Stoll
Dairy & Food Industry
Agri. Utilization Research Inst, MN

Dr. Jeremy J. Stone, President
Federation of American Scientists

Shira Aeroponics
Saul Strauch

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Owner/Operator
Kahili Farm Nursery

Mr. Roger Stuber
Stuber Ranch

Dr. William J. Studer
Ohio State University

Mr. Suzuki, Japanese Embassy
Ministry of Agriculture,
Forestry and Fisheries, CA

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Director of Libraries
University of Massachusetts

Mr. Jose Taracido, Habitat
Coordinator
Pheasants Forever, PA

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Federal Library & Infor Ctr Comm
Library of Congress

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Henry Alexander Hunt Memorial Lib
Fort Valley State College, GA

Mr. Michael Telford, Exec Sec
Iowa Pork Producers

Mr. Jerry G. Tew, Tech Dir
Amer Assoc Textile Chemists &
Colorists
AATCC Technical Center, NC

Ms. Mary Kay Thatcher
American Farm Bureau Federation

Mr. Donald B. Thompson
Pennsylvania State Univ

Mr. Edward Thompson
American Farmland Trust

Mr. James C. Thompson, Librarian
University of California

Mr. Jerry Thompson, Environmental Eng
Air Products & Chemicals, PA

Dr. Lew Thompson
State Veterinarian, WV Dept of
Agriculture

Mr. Robert Thompson
Winrock Foundation
Winrock International, AR

Dr. Mark Ticehurst, President
Biobase Technologies, Inc.

Mr. Robert L. Todd, Dir
North Dakota State Univ
Agricultural Experiment Stat

V. Tolmay and G. Prinsloo
Agricultural Research Council
Grain Crops Institute
Republic of South Africa

Dr. Trevor Tomkins
Milk Specialties Company

Mr. David G. Topel, Dean-Dir
Iowa State Univ, Agriculture
& Home Economics Experiment Stn

Dr. Charles T. Townley
New Mexico State University

Mr. Alan Townsend

Tri-Valley Growers
Modesto, CA

Dr. Paula Trumbo
International Life Sciences Inst

Dr. William Tucker
DNA Plant Technology Corp, CA

Mr. John Turner, Pres and CEO
Conservation Fund, VA

Dr. John D. Turner, Sr. Chemist
Cotton Incorporated

Mr. Charles Upchurch, President
MS Seedsmen's Association
Delta and Pine Lane Co.

Dr. Norman Uphoff, Director
Cornell International Institute
for Food, Agri and Development
Cornell University

Ms. Vicky Urcuyo
USDA, FCS, Food Distribution

Dean Urmston, Exec Vice Pres
American Seed Trade Association

Dr. James L. Usry, Nutritionist
Heartland Lysine, Inc.

Dr. Michael A. Valenti
Delaware Department of Agriculture

Mr. John Fernandez-VanCleve, Dean-Dir
University of Puerto Rico

Dr. Frits van der Haar, Director
Ctr Intl Health, Emory Univ, GA

Dr. Roy Van Driesche, Professor
Department of Entomology
University of Massachusetts

Mr. Frank Van Konynenburg
Cling Peach Board, CA

Dr. John E. Vanderveen, Director
Ctr Food Safety and Applied Nutrition
Food and Drug Administration

Mr. Blake Vander Vorst
ND Soil Conservation Committee

Ms. Elizabeth Vasquez
Management Consulting Associates

Mr. Eric Vaughn, President
Renewable Fuels Association, DC

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Agriculture Natural Resoures
University of California

Dr. Kris Venkat
Phyton Catalytic, Inc., NY

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Office of Sci and Tech Policy

Ms. Sara Vogel, Commissioner
Dept of Agri, State of North Dakota

Ms. Jill Vorbeck
North American Fruit Explorers, IL

G. Gale Wagner
Dept of Veterinary Pathobiology
Texas Veterinary Medical Center

Dr. Phil J. Wakelyn, Manager
Environmental Health and Safety
National Cotton Council of America

Dr. Melvin E. Walker, Jr., Res Dir
Fort Valley State College, GA

Dr. Neil J. Walker
Key Ingredients, PA

Mr. Bob Walters
Agriculture Writer
Sacramento Bee

Mr. Ronald Warfield
Illinois Farm Bureau

Mr. Hugh Warren, Exec VP
Catfish Farmers of America, MS

Ms. Thedis Washington
Agricultural Reference Librarian
R M Cooper Library, Clemson Univ

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Mason Dixon Farm, Inc.

Dr. Elsie Stephens Weatherington
Johnston Memorial Lib, VA State Univ

Mr. Glen L. Weaver
Technical Services, Q.A./Q.C.
ConAgra Inc.

Dr. Samual Weaver
Quaker Oats Co, John Stuart
Laboratories

Mr. Mark F. Weber, Exec Dir
Red River Valley Sugarbeet Growers
Assoc

Mr. Duane E. Webster, Exec Dir
Association of Research Libraries

Dr. David Weddle
Mid-America Dairymen Inc.

Mr. Robert Wedgeworth, Prof
Urbana-Champaign 230 Library
University of Illinois

Mr. Mike Wehler
Natl Pork Producers Council, WI

Ms. Cindy Garretson Weibel
Executive Director
Wyoming Stockgrowers

Ms. Charlene Weif
United Tribes Technical College, ND

Ms. Beth Weil, Librarian
University of California, Berkeley

Ms. Christine Wehrman
National Corn Growers Assoc, MO

Ms. Mary Bianco-Welte
Standing Rock College, ND

Mr. Rod Weinzerel, Exec Dir
IL Corn Growers Association

Dr. Birdie O. Weir, Dir
Alabama A&M University

Mr. Mark Weltz

Mr. Richard Wenstrom

Dr. Gail Wertz, President
American Society for Virology
Univ. Alabama at Birmingham

Mr. Ronald M. Weseloh, Res
Entomologist
CT Agricultural Experiment Stat
Dept. of Entomology

Ms. Carla L. West
National Cotton Council

Dr. Keith P. West
Johns Hopkins School
of Hygiene and Public Health

Ms. Sharon M. West, Dir
Elmer E. Rasmuson Lib
Univ of Alaska Fairbanks

Dr. Stephanie A. Whalen
Hawaii Agriculture Research Ctr

Mr. Kent Whealy
Seed Savers Exchange, IA

Mr. Nott Wheeler, Jr., President
Mississippi Rice Council

Mr. William H. White
Sugarcane Research Unit, LA

Ms. Melanie Wickham, Exec Sec
Empire State Potato Club, NY

Dr. Walter Wicker
Prescott Memorial Lib, LA Tech Univ

Dr. Bruce Wiersma
Agricultural and Forest
Experiment Station, Univ of Maine

Mr. Michael Wiggett
Location Adm Officer, AZ

Dr. Glenn R. Wilde
Milton R. Merrill Lib, Utah St Univ

J. L. Willett
National Center for Agricultural
Utilization Research, IL

Ms. Carolyn Williams
South Plains Area, TX

Mr. Earl P. Williams
California Cotton Ginners &
California Cotton Growers Assoc

Ms. Edna Williams, Dir
Hollis Burke Frissell Lib
Tuskegee University

Dr. Janet C. Williams, VP
American Meat Institute
Scientific and Technical Affairs

Ms. Mimi Williams
Subtropical Agricultural Res Stat, FL

Mr. Paul Williams
Crucifer Genetics Cooperative
Dept. of Plant Pathology, Univ Of WI

Mr. Paul Willis
University of Kentucky

Mrs. Elizabeth B. Wilson
Lincoln University

Dr. Herb Wolf
BASF Corporation, NJ

K. P. Wong
California State University-Fresno

Mr. Lyle Wong
Department of Agriculture, HI

Dr. Johnny C. Wynne, Assoc Dean
ARS, NC State University

Mr. Roger E. Wyse, Director
College of Agricultural and Life Sci
University of Wisconsin

Francis Wysocki
Seed Potato Grower, WI

Dr. Dudley V. Yates
John B. Coleman Lib
Prairie View A&M Univ

Mr. Alan L. Yoder
American Society of Farm Managers
and Rural Appraisers, Inc, CO

Dr. David Young
Rohm and Haas Co., PA

Henry A. Wallace Institute
for Alternative Agriculture, MD

Dr. R. R. Youngman, Professor
Dept of Entomology
Polytechnic Inst & State Univ, VA

Dr. James Zallie, Sr Scientist
National Starch and Chemical Co., NJ

Dr. Vincent Zehnen
Foods, Inc, WI

Mr. Robert G. Zimblelman

Dr. Steven D. Zink
University of Nevada Reno

Mr. Dale W. Zinn, Exec Dir
West Virginia University

Mr. Ted Zobeck
Wind Erosion Research, TX

Dr. James Zuiches, Dean
Washington State University

American Fisheries Society

American Geophysical Union

Animal Health Institute

American Meteorological Society

American Society of Agronomy

American Society for Horticultural
Science

American Society of Civil Engineers

American Soci of Landscape Architects

American Society for Photogrammetry and Remote Sensing

American Soci of Plant Physiologists

American Water Resources Assoc

American Public Health Association

American Humane Association

Animal Rights International

Animal Welfare Institute

American Horse Protection Association

American Society for the Prevention of Cruelty to Animals

Association of American Geographers

Consumer Federation of America

Ctr for Sci in the Public Interest

Community Nutrition Institute

Consumers Union of the United States

Holstein Association

National Corn Growers Association

Government Accountability Project

Physicians Committee for Responsible Medicine

OH State Univ Food Science & Tech

Ohio State Univ
Food Science & Technology

Nutratec

Nabisco Brand Inc.

Food Animal Concerns Trust

Red River Valley Potato Growers Assoc

Safe Tables Our Priority

Society for Range Management

Soil and Water Conservation Society

The Coastal Society

The Ecological Society of America

Humane Society of The United States

The Wildlife Society

Nebraska Cattlemen

AGRI Genetics

Idaho Alfalfa Seed Commission

International Flora Technologies, Ltd

National Sunflower Association

U.S. Geological Survey

American Agri-Women
Salem, OR

Agri Women's Leadership Network
Sterling, CO

American Natl Cattle Women, Exec VP

Assoc. of Research Directors, Inc.
Dr. P. S. Benepal, Exec. Secretary
Virginia University

National Cotton Women's Committee
Beth Buehler, National Coordinator

National Florist Association
Marti Hall, President (minority retail florists)

Women Involved in Farm Economics
Dutton, MT

Council of 1890 Presidents
Dr. Ernest C. Holloway, President

Intertribal Agriculture Council

Minority-Owned Business Technology Transfer Consortium
Janice Leek, Executive Director

African American Environmentalist Association

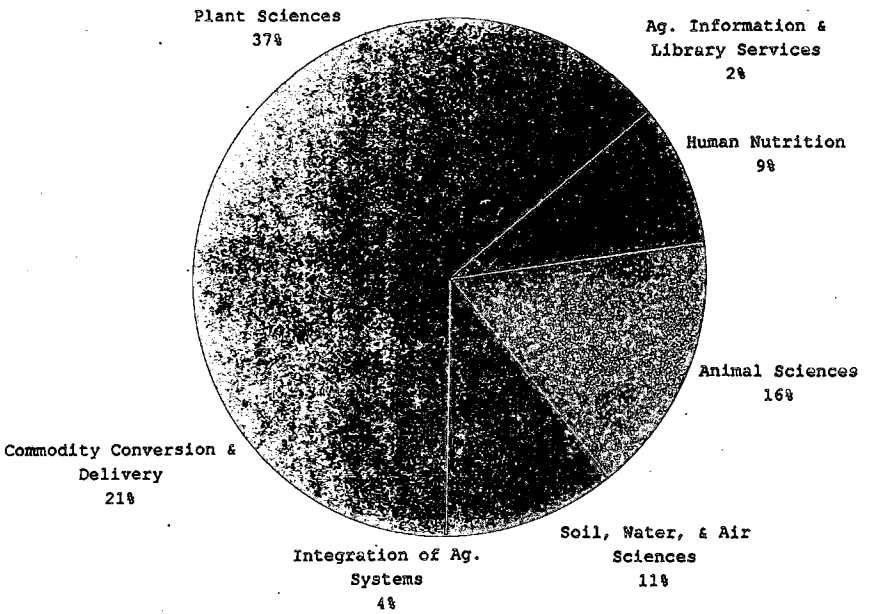
TABULAR BUDGET DISPLAYS

Mr. Skeen: Please submit for the record graphs illustrating the ARS funding of selected activities, funding by program, and funding for selected commodities, as well as the ARS budget as a share of total federal research and development investment. Please note that the hearing record is printed in black and white and adjust your graphics accordingly.

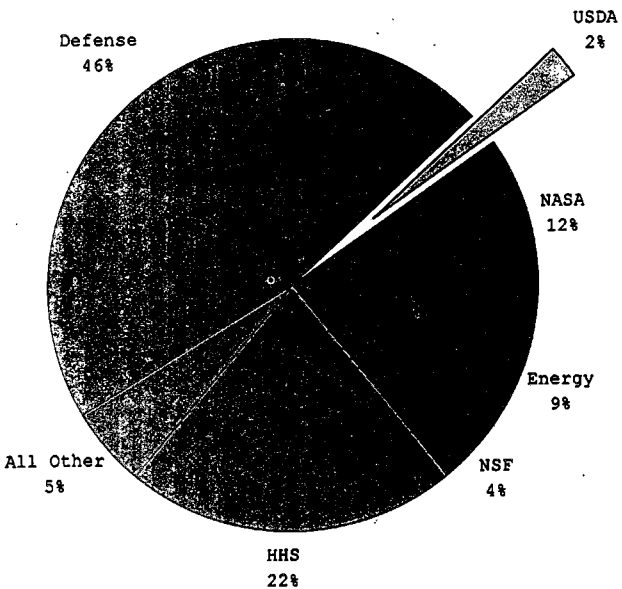
Response: Graphs illustrating the ARS funding of selected activities, funding by program, and funding for selected commodities, as well as the ARS budget as a share of total federal research and development investment will be provided for the record.

[The information follows:]

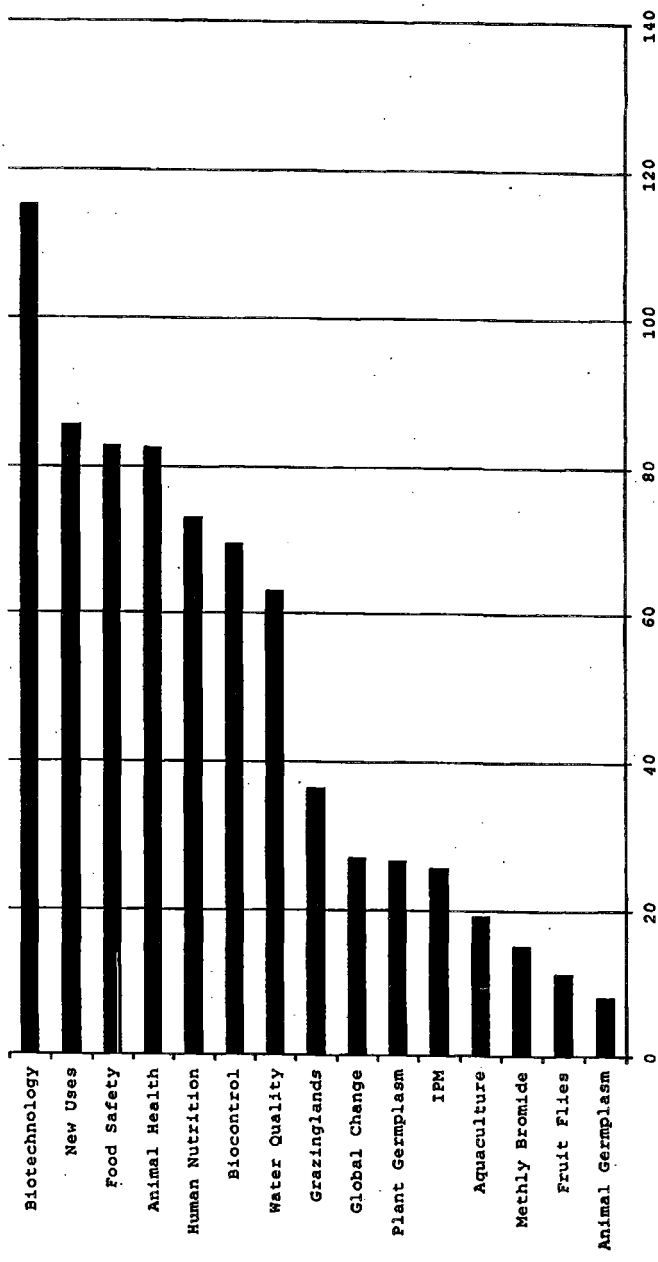
AGRICULTURAL RESEARCH SERVICE
FY 2000 Funding by Program
($ Millions)



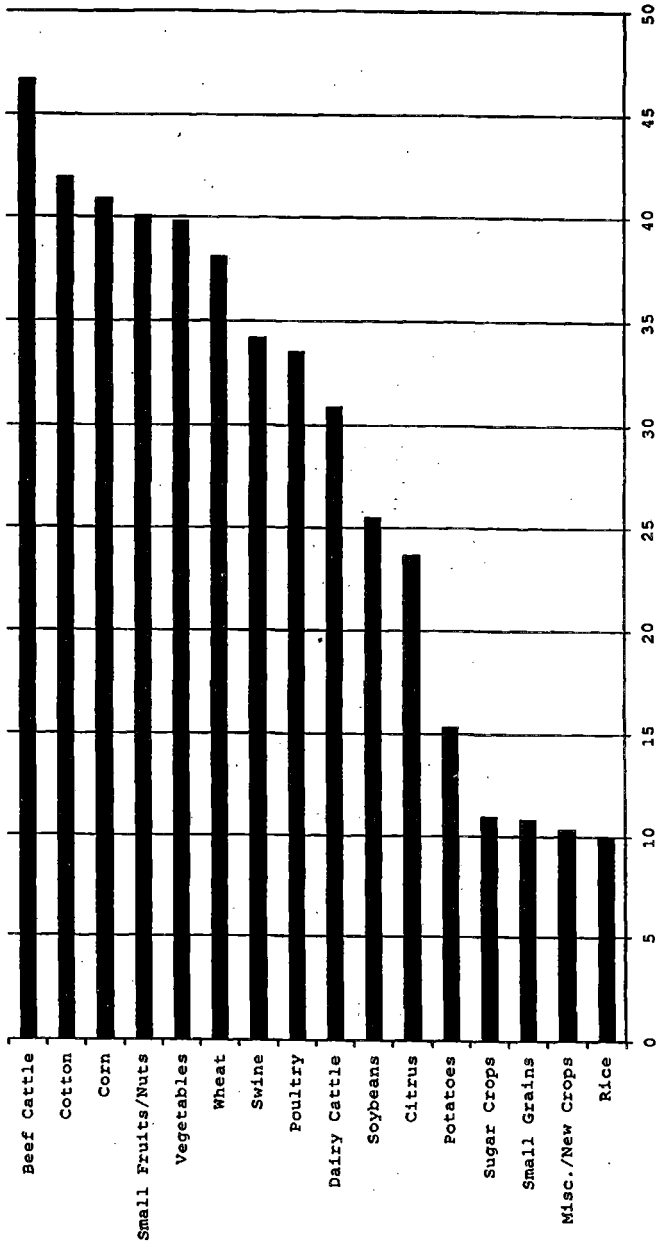
FEDERAL GOVERNMENT
2000 R&D
($ Billions)



AGRICULTURAL RESEARCH SERVICE
FY 2000 Funding of Selected Activities
($ Millions)



AGRICULTURAL RESEARCH SERVICE
FY 2000 Funding for Selected Commodities
($ Millions)



FISCAL YEAR 2000 HIGHLIGHTS

Mr. Skeen: Please submit for the record tables and narrative highlighting significant items and directions contained in Congressional action on the fiscal year 2000 appropriations bill, including the salaries and expenses account, the buildings and facilities account, and proposed project terminations.

Response: The requested information appears in the Conference Report #106-354 for Agriculture, Rural Development, Food and Drug Administration, and Related Agencies for fiscal year 2000, pages 84 to 88. Excerpts of the pages pertinent to the Agricultural Research Service's salaries and expense account, buildings and facilities account, and proposed project terminations are provided for the record.

[The information follows:]

AGRICULTURAL RESEARCH SERVICE

The conference agreement provides $834,322,000 for the Agricultural Research Service instead of $823,381,000 as proposed by the House and $809,499,000 as proposed by the Senate.

The following table reflects the conference agreement:

	Amount
FY 1999 Appropriation	$785,518,000
Agricultural Genome	2,000,000
Bioinformatic tools, biol. databases, and info mgmt (Plants)	250,000
Columbia, MO	(250,000)
National Plant Germplasm System	1,750,000
Albany, CA	(250,000)
Ft. Collins, CO	(250,000)
Ames, IA	(250,000)
Beltsville, MD	(250,000)
Columbia, MO	(250,000)
Ithaca, NY	(250,000)
Pullman, WA	(250,000)
Emerging Diseases and Exotic Pests	3,775,000
Wheat and barley scab	375,000
Madison, WI	(300,000)
Raleigh, NC	(75,000)
Consortium of Land Grant Universities	1,800,000
Cereal Rust, St. Paul, MN	250,000
New emerging and exotic plant diseases	250,000
Fort Pierce, FL	(250,000)
Reniform Nematode, Stoneville, MS	500,000
Noxious Weeds, Burns, OR	250,000
Avian Pneumovirus, Athens, GA	250,000
Poult Enteritis Mortality Syndrome, Athens, GA	100,000
Food Quality Protection Act Implementation	250,000
IPM tech. for fruits/veg/organophosphates and carbamates	250,000
Ft. Pierce, FL	(250,000)

Food Safety	11,000,000
Preharvest:	
Manure handling and distribution	1,750,000
Miss. State, MS	(500,000)
Ames, IA	(250,000)
Clay Center, NE	(250,000)
Lincoln, NE	(250,000)
Bushland, TX	(250,000)
Phoenix, AZ	(250,000)
Antibiotic resistance	1,350,000
Athens, GA	(450,000)
Ames, IA	(450,000)
College Station, TX	(450,000)
Risk assessment	1,550,000
Athens, GA	(400,000)
West Lafayette, IN	(250,000)
Clay Center, NE	(500,000)
Beltsville, MD	(400,000)
Fungal toxins	250,000
Athens, GA	(250,000)
Zoonotic disease risk	250,000
Fayetteville, AR	(250,000)
Aflatoxin	750,000
Stoneville, MS	(500,000)
Phoenix, AZ	(250,000)
Postharvest:	
Pathogen control in fruits/vegetables	1,200,000
Beltsville, MD	(400,000)
Wyndmoor, PA	(400,000)
Albany, CA	(400,000)
Pathogen control during slaughter/processing	500,000
Athens, GA	(500,000)
Antimicrobial resistance	800,000
Wyndmoor, PA	(400,000)
Peoria, IL	(400,000)
Food Safety Research, Listeria Monocytogenes and E. Coli Pathogens	1,000,000
Listeriosis, Sheep Scrapie, Ovine Progressive Pneumonia Virus (OPPV), Pullman, WA/Dubois, ID	600,000
Food Safety Engineering, West Lafayette, IN (Purdue, Univ.)	500,000
Hyperspectral Imaging, Stennis Space Center, MS	500,000
Global Change	900,000
Carbon cycle research	900,000
Auburn, AL	(400,000)
Mandan, ND	(250,000)
Morris, MN	(250,000)
Human Nutrition	3,000,000
Little Rock, AR	(500,000)
San Francisco/Davis, CA	(500,000)
Boston, MA	(500,000)
Beltsville, MD	(500,000)
Grand Forks, ND	(500,000)
Houston, TX	(500,000)
Sustainable Ecosystems	1,500,000

Eutrophication, harmful algal blooms and hypoxia	500,000
University Park, PA	(250,000)
Watkinsville, GA	(250,000)
Predict ecological impacts of extreme natural events	500,000
Lubbock, TX	(250,000)
El Reno, OK	(250,000)
Biologically-based IPM for invasive weeds/pests	500,000
Logan, UT	(250,000)
Kearneysville, WV	(250,000)
Subtotal	22,425,000
Contingency Funds	(928,500)
Pay Cost	4,999,500
Subtotal	26,496,000
Alternative Replacement Crops	800,000
Animal Vaccines, Joint Research between Univ. of CT/Univ. of MO	2,000,000
Animal Waste Management, IL	200,000
Appalachian Pasture-Based Beef System, Beckley, WV	1,000,000
Aquaculture Research, Pine Bluff, AR	500,000
Aquaculture Systems (Rainbow Trout), Univ. of Conn	500,000
Asian Bird Influenza, Athens, GA	300,000
Binational Agricultural Research & Development (BARD) 1/	400,000
Biobased Products 1/	200,000
Biological Controls and Agric. Research:	
Center for Biological Controls, FAMU	1,000,000
Science Center of Excellence, FAMU	1,000,000
Biomedical Materials in Plants, Beltsville, MD	500,000
Center for Food Safety/Post Harvest Technology, MS St. Univ.	300,000
Fish Diseases, Auburn, AL	500,000
Floriculture and Nursery Crop Research (portion for cooperative agreements with university partners, incl. Calif. Univ. & Cornell Univ.; $200,000 for Ohio State Univ.)	2,000,000
Golden Nematode, Cornell Univ	200,000
Grape Rootstock, Geneva, NY (Ithaca, NY Worksite)	250,000
Greenhouse Lettuce Germplasm, Salinas, CA	250,000
Lettuce Geneticist/Breeder Position, Salinas, CA	250,000
Lyme Disease, Yale Univ	200,000
Mid-West/Mid-South Irrigation, Univ. of MO Delta Center, Portageville, MO	200,000
Nat'l Center for Cool & Coldwater Aquaculture, Leetown, WV	250,000
Nat'l Center for Dev. of Natural Products, Oxford, MS	750,000
Nat'l Sedimentation Lab, Oxford, MS:	
Acoustics	50,000
Yazoo River Basin, MS	500,000
National Warmwater Aquaculture Center, Stoneville, MS	308,000
New England Plant, Soil & Water Research Lab, Orono, ME	300,000
Northern Plains Research Lab, Sidney, MT	750,000
Organic Minor Crop Specialist, Salinas, CA	250,000
Peanut Quality Research, Athens, GA	1,000,000
Post-Harvest and Controlled Atmosphere Chamber (Lettuce), Salinas, CA	250,000
Potato Research Enhancement, Prosser, WA	250,000
Red Imported Fire Ants, Stoneville, MS	350,000
Rice Research, Stuttgart, AR	500,000

1/ Items moved from other USDA accounts.

Risk Assessment for BT Crops	200,000
Root Diseases of Wheat/Barley, Pullman, WA	500,000
Small Fruits, Poplarville, MS	750,000
Southern Insect Mgmt. (SCA with NCPA), Stoneville, MS	75,000
Sunflower Research, Fargo, ND	200,000
Sustainable Vineyard Practices Position, Davis, CA	250,000
Temperate Fruit Flies, Yakima, WA	250,000
U.S. Plant Stress & Water Conservation Lab, Lubbock, TX	750,000
U.S. Pacific Basin Agricultural Research Center, Hilo, HI	500,000
Viticulture, Univ. of Idaho-Pharma Research and Ext Center, ID	450,000
Watershed Research, Columbia, MO	325,000
Subtotal	22,308,000
Fiscal year 2000 Total	834,322,000

The conference agreement continues the fiscal year 1999 level of funding for all research projects proposed to be terminated in the President's budget. The conference agreement provides no funding for contingencies.

The conference agreement continues the fiscal year 1999 level of funding for cooperative research conducted at the Rodale Institute, PA, with the ARS Soil-Microbial Systems Laboratory.

The conferees are aware that USDA is considering the relocation of ARS scientists from the Shafter Cotton Research Station, CA. The conferees are concerned that this relocation will reduce the level of resources for cotton research conducted at the station. The conference agreement provides continued funding at the fiscal year 1999 level for this research and directs that no action be taken to shift funds or staffing resources from Shafter without the prior approval of the House and Senate Committees on Appropriations.

The conferees recognize that fruit flies are an impediment to agricultural production in Hawaii and other states and encourage the ARS to consider demonstrating in Hawaii the efficacy of area wide pest management strategies for fruit flies.

Included in the additional funds recommended for food safety research is an increase of $600,000 for research on listeriosis, sheep scrapie, ovine progressive pneumonia virus, and other emerging diseases. These funds are to be utilized by the USDA-ARS Animal Disease Research Unit in Pullman, WA, in part for collaborative research on sheep scrapie and ovine progressive pneumonia virus with the USDA-ARS Sheep Experiment Station in Dubois, ID.

BUILDINGS AND FACILITIES

The conference agreement provides $52,500,000 for Agricultural Research Service, Buildings and Facilities instead of no funds as proposed by the House and $53,000,000 as proposed by the Senate.

The following table reflects the conference agreement:

Arizona: Water Conservation & Western Cotton Laboratory, Maricopa	$1,400,000
California:	
Western Human Nutrition Research Center, Davis	9,000,000
Western Regional Research Center, Albany	2,600,000
District of Columbia: National Arboretum	500,000
Hawaii: U.S. Pacific Basin Agricultural Research Center	4,500,000
Illinois:	
National Center for Agricultural Utilization Research, Peoria	1,800,000
USDA Greenhouse complex, Urbana	400,000

Iowa: National Animal Disease Center, Ames	3,000,000
Kansas: U.S. Grain Marketing Research Laboratory,-Manhattan	100,000
Louisiana: Southern Regional Research Center, New Orleans	5,500,000
Maryland: Beltsville Agricultural Research Center, Beltsville	13,000,000
Mississippi: Biocontrol and Insect Rearing Laboratory, Stoneville	2,000,000
Montana: Fort Keogh Laboratory, Miles City	530,000
New York: Plum Island Animal Disease Center, Greenport	3,500,000
Pennsylvania: Eastern Regional Research Center, Philadelphia	4,400,000
Utah: Poisonous Plant Laboratory, Logan	270,000
Total	52,500,000

ARS PROFILE 1999

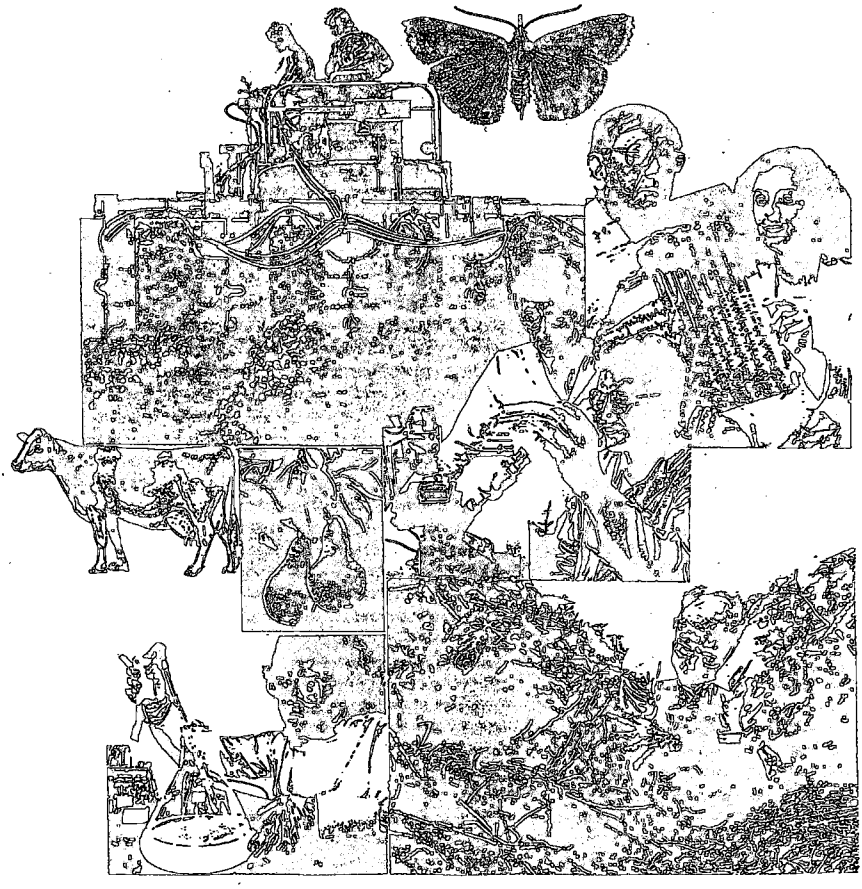
Mr. Skeen: Please submit for the record a copy of the most recent "ARS Profile" publication.

Response: A copy of the most recent "ARS Profile" publication will be provided for the record.

[The information follows:]

ARS PROFILE 2000

Agricultural Research Service • U.S. Department of Agriculture



AGRICULTURAL RESEARCH SERVICE

INVESTMENTS IN RESEARCH THAT PROVIDE THE NATION WITH A PLENTIFUL SUPPLY OF FOOD AND FIBER, PRESERVE NATURAL RESOURCES, ENHANCE HUMAN HEALTH AND NUTRITION, AND STRENGTHEN NATIONAL AND RURAL ECONOMIES

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MISSION AND RESPONSIBILITIES

The Agricultural Research Service mission is: to provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority to ensure adequate availability of high quality, safe food and other agricultural products to meet the nutritional needs of the American consumer; to sustain a viable and competitive food and agricultural economy; to enhance quality of life and economic opportunity for rural citizens and society as a whole; and to maintain a quality environment and natural resource base.

ARS serves a variety of customers and stakeholders, including the Department and Congress. Within USDA, ARS serves the Secretary of Agriculture, operating as the Department's research arm responding to the nation's critical agricultural challenges. ARS scientists, technicians and support personnel in laboratories, who are strategically located throughout the country, are at the disposal of the Secretary to investigate and solve technical problems that face American agriculture today.

Over the years, ARS has achieved major scientific breakthroughs which have benefitted farmers, ranchers, agribusiness, consumers, indeed all Americans. ARS is committed to continue enhancing the lives and well-being of every American as it strives to meet the new and emerging agricultural issues that are of concern to the nation.

ARS has primary responsibility to:

- Provide initiative and leadership in agricultural research.
- Conduct research on broad regional and national agricultural and related problems.
- Conduct research to support Federal action and regulatory agencies.
- Provide expertise to meet national food, food safety and environmental emergencies.
- Provide research support for international programs.
- Provide scientific resources to the Executive Branch and Congress.
- Transfer new knowledge, technologies and products developed through research to user groups.
- Acquire, preserve and disseminate food and agricultural information.

RESOURCES

Budget

Program Activities	FY 2000 Estimate (In Millions)
Soil, Water, and Air Sciences	$90
Plant Sciences	297
Animal Sciences	134
Commodity Conversion and Delivery	173
Human Nutrition	72
Integration of Agricultural Systems	31
Agricultural Information and Library Services	19
Repair and Maintenance of Facilities	18
Subtotal	834
Rescission	-4
Total Program Funds	830
Buildings and Facilities	52
Total Appropriated Funds	882
Advancements, Reimbursements & Miscellaneous Trust Funds	83
Total Funds	$965

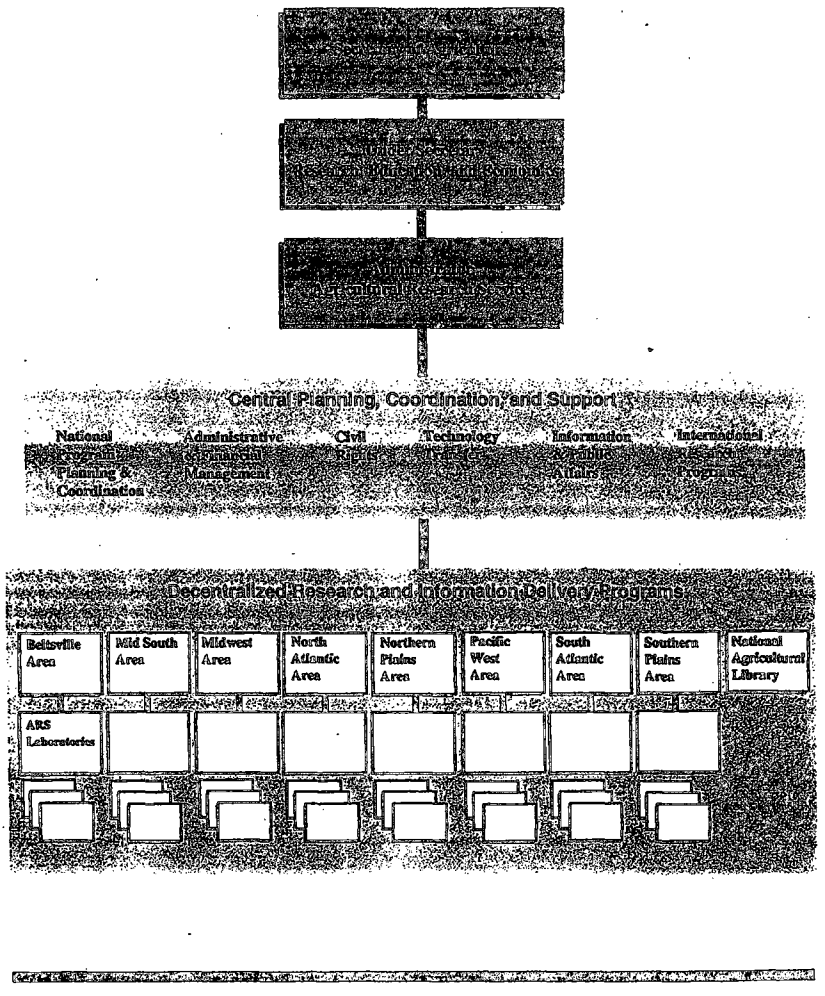
Staffing

As of September 30, 1999, there were 6,407 full-time employees and 1,738 other than full-time employees. Of the total, 477 full-time employees and 24 other than full-time employees worked in the Headquarters offices located in the Washington, D.C. metropolitan area.

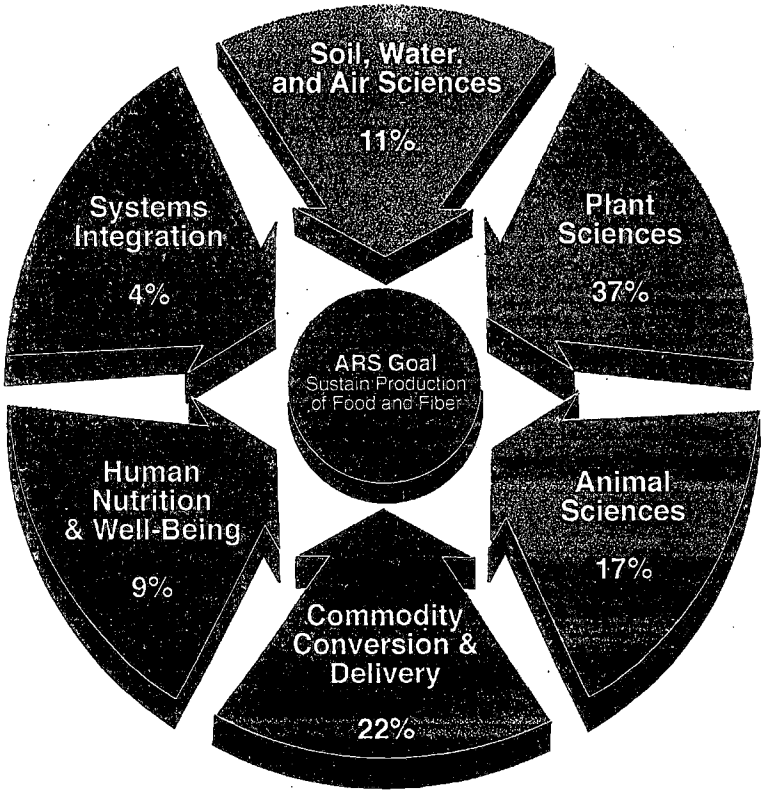
ARS' personnel includes approximately 1,900 permanent scientists and engineers and 300 temporary postdoctoral employees. Scientific fields represented include:

-Biochemistry	-Agronomy	-Soil Science
-Biology	-Nutrition	-Chemistry
-Entomology	-Parasitology	-Engineering
-Genetics/Breeding	-Pathology	-Hydrology
-Immunology	-Physiology	-Physics
-Microbiology	-Virology	-Statistics

Organization



Major Research Program Activities



MAJOR PROGRAMS AND SPECIFIC OBJECTIVES

Soil, Water, and Air Sciences

- o Conserve and enhance ***soils.***
- o Control and reduce ***soil erosion.***
- o Ensure adequate ***water resources.***
- o Protect and enhance ***water quality.***
- o Manage and utilize ***agricultural and other wastes.***
- o Improve the biodiversity of ***rangelands.***
- o Preserve and restore ***wetlands.***

Plant Sciences

- o Identify and protect ***genetic resources/biodiversity.***
- o Breed crops for ***improved characteristics.***
- o Develop new ***biological/biorational technology*** for pest control.
- o Reduce the need for chemical pesticides through the use of ***integrated/areawide pest management systems.***
- o Develop new technology to improve ***production efficiency and market quality.***
- o Improve ***small farm production systems*** to meet the needs of rural America.

Animal Sciences

- o Utilize more effectively ***germplasm diversity, disease vectors, recombinant DNA technology, gene mapping, and genetic engineering.***
- o Accelerate ***genetic improvements.***
- o Identify animals with ***genetic resistance to diseases.***
- o ***Reduce losses*** from diseases and parasites.
- o ***Control tuberculosis and parasites*** in live animals.

Commodity Conversion and Delivery

- o Maintain and improve ***food safety.***
- o Develop ***new uses, new crops and alternative processing technologies.***
- o Manage ***postharvest disinfestation and develop alternative quarantine treatments.***
- o Maintain and enhance ***commodity quality.***

MAJOR PROGRAMS AND SPECIFIC OBJECTIVES

Human Nutrition

- Determine the ***nutritional needs of infants, children and pregnant women.***
- Define the ***nutritional needs of the elderly*** to maintain health and independence.
- Identify the relationship between ***diet and resistance to diseases.***
- Survey/assess the ***nutritional status of the population.***
- Provide ***information*** on the ***nutrient composition*** of foods.

Integration of Agricultural Systems

- Identify the ***optimum combination*** of crops, soil management, fertilizers, water management, and pest control for different soils and climate conditions.
- ***Improve rangelands*** through the simulation of the relationships among soil, water, vegetation, livestock, and climate.
- Develop ***integrated animal/crop producing systems*** to make the best use of existing natural resources.
- Apply ***scientific/engineering principles*** to monitor and assess changes during storage, transport, and delivery of agricultural products.

Agricultural Information and Library Services

- Acquire, organize, manage, and provide ***access to agricultural information.***
- Utilize technology to ***promote the availability of agricultural and scientific information electronically.***
- Maximize access to agricultural information through collaborative efforts.
- Enhance global competitiveness through the ***international exchange of agricultural information.***
- As a national library of the United States, provide stewardship of the agricultural legacy of the nation by ***preserving and protecting information for future generations.***

ACTION/REGULATORY AGENCIES

ARS serves as the lead Federal agency for agricultural research. Its responsibilities include a mandate to respond to the high priority research needs of action and regulatory agencies of the Department of Agriculture, and other Federal Departments and agencies.

ARS has the responsibility of providing research support to the action agencies because it has:

- Broadly based, cost-effective research programs.
- Highly qualified research scientists and support personnel.
- Costly, highly technical scientific equipment and specialized facilities (e.g., National Animal Disease Center, Plum Island Animal Disease Center, and U.S. Meat Animal Research Center).
- Flexibility to quickly redirect resources for emergency needs.
- Administrative mechanisms in place to work with universities and private industry (through cooperative research and development agreements).
- Scientific knowledge to provide research leadership in coordinating programs across USDA agencies.
- Research autonomy/objectivity to avoid conflicts of interest.

Agencies Served by ARS

Currently, ARS provides research support to the following USDA agencies:

- Agricultural Marketing Service
- Animal and Plant Health Inspection Service
- Farm Service Agency
- Food and Nutrition Service
- Food Safety and Inspection Service
- Forest Service
- Grain Inspection, Packers, and Stockyards Administration
- Natural Resources Conservation Service

In addition, ARS provides agricultural research support to the Department of Defense and the National Institutes of Health.

ARS research conducted in response to the needs of USDA action agencies and other Departments/agencies is funded from direct appropriations, fund transfers and reimbursements. In FY 1998, ARS is committed to conducting research for the action agencies and other Departments/agencies in the amount of $210 million.

TECHNOLOGY TRANSFER AND COMMERCIALIZATION

ARS is a leader within the Federal government in promoting and facilitating the application and commercialization of technology resulting from its research.

- Over 750 Cooperative Research and Development Agreements (CRADAs) have been established with industry since 1986. Under these agreements, the private firms provide valuable information which helps guide ARS research and marketing efforts essential for the commercialization of the product or process. In return, an option to an exclusive patent license on the product/process is granted to the industry partner.

- About 200 patent licenses are active which allow industry to make, use, sell, and import ARS owned or co-owned inventions.

- ARS currently has a portfolio of approximately 670 patents and 330 patents pending.

In keeping with the intent of the Federal Technology Transfer Act, ARS gives first preference for exclusive licenses of its technology to small businesses. More than half of ARS' current licenses and CRADAs are with small, rural and/or minority- or women-owned businesses. More than 50 small and/or rural businesses have been created based on ARS patented technology.

Examples of products currently available as a direct result of ARS' technology transfer program include:

- Oatrim--A fat substitute derived from oats which has been incorporated into milk by Golden Jersey Dairy Products of Vero Beach, Florida to produce a new low-fat milk product.

- Aspire--A biological control against postharvest diseases of apples and pears, manufactured and marketed by Ecogen of Langhorne, Pennsylvania.

- Fruit Fly Control--A fruit fly trapping system, manufactured and marketed by Consep, Inc. of Bend, Oregon, which incorporates a feeding attractant to lure both male and female insects for effective monitoring and control.

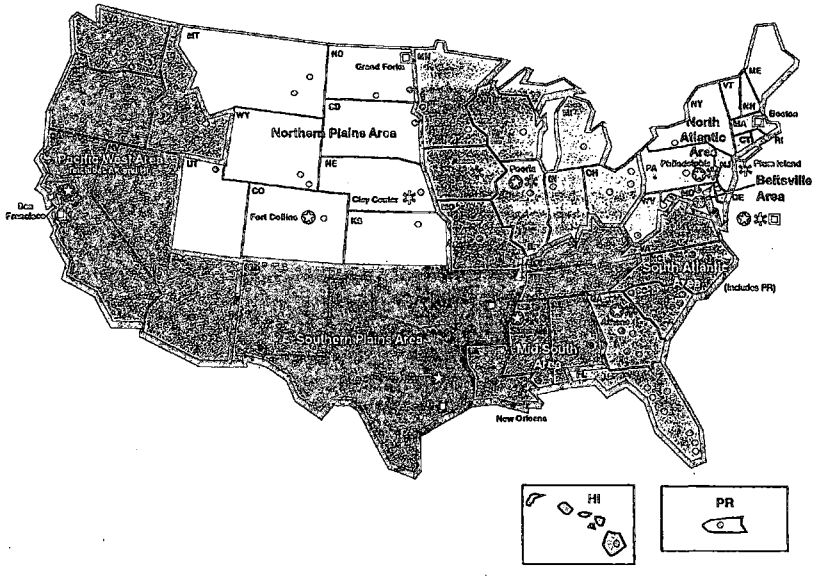
NATIONAL PROGRAMS

ARS manages its research projects under the following 23 national program areas.

Animal Production, Product Value, and Safety	***Natural Resources and Sustainable Agricultural Systems***	***Crop Production, Product Value, and Safety***
Animal Genomes, Germplasm, Reproduction, and Development	Water Quality and Management	Plant, Microbial and Insect Germplasm Conservation and Development
Animal Production Systems	Soil Resource Assessment and Management	Plant Biological and Molecular Processes
Animal Health	Air Quality	Plant Diseases
Arthropod Pests of Animals and Humans	Global Change	Crop Protection and Quarantine
Animal Well-Being and Stress Control Systems	Grazinglands Management	Crop Production
Aquaculture	Manure and Byproduct Utilization	New Uses, Quality, and Marketability of Plant and Animal Products
Human Nutrition Requirements, Food Composition, and Intake	Integrated Farming Systems	Bioenergy and Energy Alternatives
Food Safety (Animal and Plant Products)		Methyl Bromide Alternatives

Agricultural Research Service Locations

- ⊙ Area Headquarters
- ✲ Research Centers
  - ERRC, Philadelphia, PA
  - NCAUR, Peoria, IL
  - SRRC, New Orleans, LA
  - WRRC, Albany, CA
  - BARC, Beltsville, MD
  - NADC, Ames, IA
  - PIADC, Plum Island, NY
  - Richard B. Russell Research Center, Athens, GA
  - Roman L. Hruska U.S. Meat Animal Research Center, Clay Center, NE
  - Jamie Whitten Delta States Research Center Stoneville, MS
- ⊡ Human Nutrition Research Centers
  - Beltsville, MD
  - Boston, MA
  - Grand Forks, ND
  - Houston, TX
  - Little Rock, AR
  - San Francisco, CA
- ○ Research Locations


MT
ND
Grand Forks
MN
WY
SD
Northern Plains Area
NE
UT
CO
Fort Collins
Clay Center
KS
Pacific West Area
Albany
Davis
Riverside
Parlier
Shafter
Reno
Boise
Logan
Prosser
Pullman
Moscow
Aberdeen
Sidney
Mandan
Miles City
Bozeman
Dubois
Sheridan
Cheyenne
Akron
Scottsbluff
Ogallala
Lincoln
Manhattan
Hays
Garden City
Woodward
Stillwater
Chickasha
Lubbock
Bushland
Temple
Weslaco
Kerrville
Uvalde
Beeville
Corpus Christi
Houston
Baton Rouge
Lake Charles
Alexandria
Monroe
Jackson
Stoneville
Mississippi State
Tifton
Byron
Dawson
Athens
Auburn
Poultry
Fayetteville
Booneville
Stuttgart
Jonesboro
Columbia
Portageville
Delta Center
Memphis
Crop Protection
Peoria
Urbana
Wooster
Columbus
Wyndmoor
Philadelphia
Kimberton
Plum Island
Beltsville
Area
Orono
Boston
Ithaca
Geneva
Morgantown
Kearneysville
Lexington
Frankfort
Raleigh
Florence
Watkinsville

MAJOR RESEARCH CENTERS

Research activities are carried out at more than 100 laboratories throughout the nation and in several foreign countries. Some of ARS' facilities are located on university campuses and at State Agricultural Experiment Stations to enhance cooperation and interaction with university and State scientists. This type of arrangement encourages joint use of expensive research equipment and other essential facilities such as libraries, computers, and experimental plots.

Some of ARS' major national and regional facilities are:

- ***Beltsville Agricultural Research Center*** (Beltsville, MD)--The largest center for national agricultural research in the United States, possibly the world. More than 1,500 staff including 300 scientists are located at the center which conducts research on 6,500 acres of land utilized for plant, animal, human nutrition, and environmental research. In addition, major national taxonomic collections of insects, fungi, seeds, nematodes, animal parasites, and rhizobia are located at the center. These collections and their evaluations provide essential services for other scientists, industry, and regulatory agencies.

- ***Regional Research Centers***--The four regional research centers conduct research on the development of new and expanded uses of a variety of agricultural commodities including milk, meat, hides, wool, fats, oils, fruits, and vegetables. The four regional centers are:

  - *Eastern Regional Research Center, Wyndmoor, PA.*
  - *National Center for Agricultural Utilization, Peoria, IL.*
  - *Southern Regional Research Center, New Orleans, LA.*
  - *Western Regional Research Center, Albany, CA.*

- ***Richard B. Russell Agricultural Research Center*** (Athens, GA)--The center conducts research in a number of areas: microbiological safety of poultry meat products (e.g., limiting or preventing Salmonella and campylobacter contamination); quality assessment (i.e., on wheat, rice, corn, kenaf, flax, cotton, and processed foods); and reproductive efficiency and carcass fat reduction.

MAJOR RESEARCH CENTERS

- ***U.S. Meat Animal Research Center*** (Clay Center, NE)--A unique facility which solves some of the most difficult problems facing the U.S. livestock industry. Research at the center focuses on genetics and breeding, nutrition, reproduction, biological engineering, meats science, animal health, and life cycle production systems for beef cattle, sheep, and swine.

- ***Plum Island Animal Disease Center*** (Greenport, NY)--The only site in the U.S. authorized by Congress to carry out research on foreign animal diseases. Foreign animal diseases are an ongoing threat to U.S. livestock. The center is located on a Federally-owned island off Long Island.

- ***National Animal Disease Center*** (Ames, IA)--The center is one of the largest animal disease research centers in the world. The center conducts basic and applied research on domestic diseases of national importance in cattle, sheep, swine, horses, and poultry. Chemists, bacteriologists, veterinarians, physiologists, entomologists, and pathologists work together on interdisciplinary approaches to disease control and eradication.

- ***Jamie Whitten Delta States Research Center*** (Stoneville, MS)--The center conducts research on cotton, cotton ginning, soybeans, catfish, insects, weeds, application and production technology, and precision agriculture to improve agricultural production and processing in Mississippi and the Mid-South. Forty-six scientists and 145 support personnel work at the center.

- ***National Soil Tilth Laboratory*** (Ames, IA)--The laboratory researches and evaluates farming practices that will improve surface and ground water and air quality, while ensuring the long-term productivity and conservation of the nation's soil resources. The research is frequently conducted in partnership with the National Resources Conservation Service; Cooperative State Research, Education, and Extension Service; EPA; and U.S. Geological Survey.

- ***U.S. Salinity Laboratory*** (Riverside, CA)--The laboratory researches problems related to crop production on salt-affected lands, sustainability of irrigated agriculture, and ground water. Predictive models are developed to increase yields, quality, and desirability of agronomic and horticultural plants grown on salt-affected soils.

MAJOR RESEARCH CENTERS

- ***National Seed Storage Laboratory*** (Fort Collins, CO)--Located on the Colorado State University campus, the laboratory houses the entire base seed collections of all major U.S. crops for long term storage and preservation. It is the most extensive germplasm repository of major crops in the world. Currently, there are about 210,000 seed samples in the storage laboratory.

- ***Human Nutrition Research Centers***--ARS researches the effects of human nutrition on health at the following centers:

  - *Arkansas Children's Nutrition Research Center, Little Rock, AR*--Conducts research on diet and dietary factors that optimize the nutrition and health of children and maximize their health as adults.

  - *Beltsville Human Nutrition Research Center, Beltsville, MD*--Examines the role of food and its components in optimizing human health and reducing the risk of nutritionally-related disorders.

  - *Children's Nutrition Research Center at Baylor College of Medicine, Houston, TX*--Defines the nutrient needs of healthy children (from conception through adolescence), and pregnant and nursing women.

  - *Grand Forks Human Nutrition Research Center, Grand Forks, ND*--Determines mineral requirements that prevent disease and promote health.

  - *Human Nutrition Research Center on Aging at Tufts University, Boston, MA*--Determines the nutritional and dietary requirements of the maturing and elderly population.

  - *Western Human Nutrition Research Center, San Francisco, CA*--Studies ethnic and lifestyle differences in determing food needs and food consumption patterns.

NATIONAL AGRICULTURAL LIBRARY

The National Agricultural Library (NAL) has been serving agriculture since 1862 and was designated a national library of the United States in 1962. Today, NAL is the largest agricultural library in the world and serves organizations and individuals worldwide.

As the chief agricultural information resources of the United States, NAL's mission is to "ensure and enhance access to agricultural information for a better quality of life." In recent years, Congress has broadened NAL's responsibilities to include providing leadership in developing a comprehensive agricultural information network. To this end, NAL serves as the coordinator and primary resource for a nationwide network of land-grant university libraries, USDA field libraries and other libraries. The NAL collection includes over 3.3 million items and covers all aspects of agriculture and related sciences. Dating back to the 16th century, the collection includes materials in 75 different languages and grows by tens of thousands of items annually.

AGRICOLA (AGRICultural On Line Access), NAL's computerized database of over 3 million citations, is accessible electronically. Agricultural information is also available through NAL homepage (http:www.nal.usda.gov), which averages 4.5 million hits annually. Complementing AGRICOLA and the homepage is AgNIC (Agricultural Network Information Center), an electronic network of agricultural information resources being developed by NAL and land-grant universities. NAL envisions that AgNIC, when fully developed, will be the most comprehensive electronic agricultural information resource in the world.

To speed the delivery of materials to NAL users, NAL now delivers documents electronically whenever possible. NAL is also leading the effort to preserve the nation's agricultural literature, part of which is embrittled and in jeopardy of being lost. NAL is establishing procedures for converting paper publications into digital formats. NAL is also working to develop plans for preserving electronic publications and State agricultural literature.

NAL operates an active Reference department, staffed by librarians who give personalized assistance to NAL users. NAL also operates specialized Information Centers that provide in-depth coverage on such subjects as food and nutrition, animal welfare, rural development, and water quality.

INTERNATIONAL ACTIVITIES

The Office of International Research Programs (OIRP) supports ARS' research laboratories in Montpellier, France; Brisbane, Australia; and Buenos Aires, Argentina. ARS also maintains field stations in Greece, Italy, China, and Panama.

Most of the severe pests in North America are from exotic sources. New pest "invasions" continue to occur.

ARS' international research laboratories are critical in the development of controls for invasive arthropod and weed pests in the U.S. At these laboratories, ARS and cooperating foreign national scientists work together to determine the ecological/geographical origins of exotic pests, their basic biology and their host characteristics. Foreign exploration and testing is conducted to develop biologically-based alternatives to chemical pest control.

OIRP serves as the point of contact for international activities within ARS and provides liaison with international organizations, foreign governments, and other U.S. agencies involved in international scientific collaboration.

OIRP also directs the ***Foreign Research Associates Program*** which serves as the official mechanism to place foreign scientists in ARS laboratories and other U.S. laboratories. Under this program, assistance is provided and funding opportunities are identified to foreign scientists to facilitate mutually beneficial research.

In addition, OIRP manages the ***U.S.-Israel Binational Agricultural Research and Development (BARD) Program*** which was established in 1977 to promote and support cooperative agricultural research that is beneficial to both countries. Under BARD, over 800 proposals for research from public and private research institutions have been funded.

ARS currently has over 300 formal cooperative projects in more than 50 countries. These cooperative activities with foreign national institutions and international agricultural research centers provide mutual benefits to U.S. agriculture and our cooperating partners abroad.

MAJOR ACCOMPLISHMENTS

- Retired ARS entomologists Edward Knipling and Raymond Bushland were awarded the ***1992 World Food Prize*** for their work in developing the sterile-male-release technique of insect control. Their pioneering breakthrough in biological insect control began in the 1950s, at a time when pest control strategies depended almost entirely on chemical pesticides. The sterile-male-release technique has led to the elimination of the screwworm in the United States and Mexico. This eradication has saved the livestock industry, and ultimately the consumer, billions of dollars.

- In 1929, Alexander Fleming published his famous paper describing ***penicillin***, but it was not until 1940 that penicillin was mass producible. ARS scientists developed the deep fermentation technique that created the breakthrough for this mass production, just in time to save thousands of lives in World War II.

- In 1946, the ARS laboratory in Winter Haven, Florida, in cooperation with the Florida Citrus Commission, found a method for developing ***orange juice concentrate*** into a healthy flavorful drink. The market for frozen concentrated orange juice today is worth hundreds of millions of dollars.

- Basic thermodynamic and enzymologic research at the ARS Western Regional Research Center in Albany, California, in the 1950s and 1960s led to the technology which is the basis of the ***frozen food*** industry today.

- In the 1950s, ARS scientists in New Orleans helped save the U.S. cotton industry by revolutionizing the wearability of cotton clothes with the development of ***permanent-press cotton*** and cotton blends. This breakthrough dramatically cut the time people need to spend ironing, and almost singlehandedly saved the cotton industry.

- More recently, ARS scientists have developed treatments to make ***cotton fabric flame retardant***. Such flame-retardant treated fabric is worn by U.S. astronauts, and used in military uniforms and civilian clothes.

MAJOR ACCOMPLISHMENTS

- ARS agronomist Edgar E. Hartwig helped transform soybeans from an ordinary forage to the second most valuable crop in the United States. From 1953 to the present, ***soybean*** acreage in the South has increased from 2.5 million acres to about 14 million acres, and average yields have doubled. Seventy-five percent of today's soybean acreage in the South is planted to cultivars developed by Hartwig.

- In the late 1950s, an ARS research team in Philadelphia came up with the key steps to turn potatoes into ***instant potato flakes***. Today, millions of pounds of potato flakes worth hundreds of millions of dollars are produced annually in the United States.

- In the 1950s and 1960s, ARS research on biochemical transformations of carbohydrates by microbial enzymes led to significant technological developments which were instrumental in the commercial productions of ***corn sweeteners and alcohol fuels from starch***.

- ARS research chemist Robert W. Holley was awarded the ***1968 Nobel Prize*** in Physiology and Medicine for isolating and characterizing the first nucleotide sequence of transfer ribonucleic acid (RNA), a basic building block of life.

- ARS scientists discovered the smallest known agent of plant disease, ***the viroid***--a feat comparable to the discovery of bacteria in the late 1800s. A single viroid--80 times smaller than known viruses--was found to cause more than a dozen different plant diseases.

- The Green Revolution, which brought the promise of self-sufficient food production in poor countries, was in part due to research at an ARS lab in Pullman, Washington. ARS scientists there helped develop ***Gaines wheat*** (the first commercial semidwarf cereal grain cultivar in North America), and established the high yield potential of semidwarf winter wheat.

MAJOR ACCOMPLISHMENTS

- ARS scientists invented ***"Superslurper,"*** a cornstarch derivativ capable of absorbing hundreds of times its weight in water. Superslurper has been put to dozens of uses from diapers and baby powders to fuel filters, batteries and laundry bags.

- ARS developed a method for making ***printing ink*** from 100-percent soybean oil that could reduce the use of petroleum and increase demand for U.S. grown soybeans. If all newspaper ink were to be made from soy oil, it would utilize 40 million bushels of soybeans.

- ARS research at the Eastern Regional Research Center in Philadelphia developed ***polyamide from soybean oil***, the curing agent component of widely used two-part adhesives ("epoxy glues"). Millions of pounds of soybean oil each year is used in these adhesives.

- During World War II, ARS scientists at the Eastern Regional Research Center developed methods of treating fats and oils to produce epoxidized oils which are used in vinyl plastics. Without the ***epoxidized oil*** additive, vinyl plastics rapidly become brittle and decompose.

- Studies at ARS' National Center for Agricultural Utilization Research have led to ***biodegradable plastics*** containing up to 50 percent starch. Also, related research has led to the use of starch as an encapsulating agent to achieve sustained release of pesticides, thereby reducing their environmental impact.

- ARS researchers developed the ***Flame grape***, a seedless red grape that has given rise to a new industry. Today, an average of 30 million pounds of Flame grapes valued at about $130 million to growers are harvested each year from California vineyards.

- During World War II, ARS scientists identified and solved the problems associated with adding ***soybean oil to margarine***. By 1970, soybean oil dominated the margarine market.

MAJOR ACCOMPLISHMENTS

- ARS scientists developed a fat substitute named ***Oatrim*** which has been commercialized in meat, dairy, and bakery products, by ConAgra Inc., Rhone-Poulenc Corporation, and Quaker Oats, Inc. Oatrim is effective in reducing calories, fat, and blood cholesterol.

- ARS research in animal and veterinary science has led to the eradication of the following diseases: ***vesicular exanthema, Venezuelan equine encephalomyelitis, Avian influenza, sheep scabies, exotic Newcastle disease***, and ***hog cholera***. In 1971, the first year the ARS-developed vaccine for ***Marek's disease*** was made available for commercial use, $30 million in losses were avoided. In this one year of use, the savings paid back nearly 100 percent of the 10-year investment of $32 million it took to develop the vaccine. In addition, the development of a vaccine against ***foot-and-mouth disease*** by ARS has helped prevent an outbreak of this highly contagious disease of cattle, sheep, swine, and goats in the United States.

- New cultural methods, and chemical and biological controls being developed by ARS scientists are leading to the eradication of the ***boll weevil***. More than 4.5 million acres in California, Arizona, Virginia, North and South Carolina, Georgia, and Florida are now boll weevil free. Another two million acres in Texas, Louisiana, Arkansas, Mississippi, Alabama, and Tennessee are presently involved in eradication.

- ARS scientists first identified and characterized ***Phytochrome***, the physicochemical agent that regulates all aspects of plant growth from germination to flowering to fruiting in response to changes in the amount of daylight.

- ARS researchers have been increasing the understanding of the nutritional needs of the elderly, infants, and other specialized groups. For example, ARS researchers have found a link between lower levels of vitamin B6, folate, and taurine in elderly diets and the ***development of cataracts***. Cataracts are responsible for over 50 percent of all blindness. Researchers have also been developing tables of specific nutrient content of foods, such as selenium in different cuts of beef, and carotenoid in fruits and vegetables.

HOMEPAGE

ARS has its own web site at **http://www.ars.usda.gov/.** Here you can "Find the Expert" which puts you in touch with some of the best minds in the country on topics like food safety, human nutrition, water quality, animal and plant diseases, and new crop varieties. The front page shown below, provides a wealth of information on ARS web sites, and its programs and research.

USDA ars

Agricultural Research Service
United States Department of Agriculture

Search Links

Find the Expert at ARS

News & Information

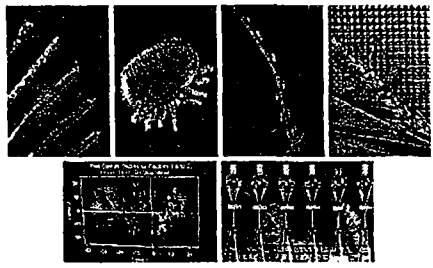
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Job Opportunities

The Organization

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FEDERAL PAY RAISE

Mr. Skeen: The fiscal year 2001 budget proposes an increase of $8.5 million to partially offset the cost of the proposed Federal pay increase. What is the full cost of the pay raise for your agency?

Response: The budget request for increased pay cost for fiscal year 2001 of $8.5 million represents about one-half of the full amount of $18.7 million required to cover the anticipated increase in Federal salaries of $3.7%.

Mr. Skeen: What is the impact of the partial pay raise absorption?

Response: These costs will be absorbed by every ARS research laboratory. Each laboratory will be required to finance the full costs of increased salaries and benefits within its operating budget. This will result in further reductions to expenditures in each of the research projects -- scientific equipment, cooperative agreements, research supplies, travel, employment of full-time and temporary personnel support, postdoctoral research appointments. These absorptions will have the greatest impact on those ARS locations and support units which are already in a tight financial situation. Based on prior year experience, two-thirds of all ARS locations did not benefit from annual appropriation increases since the majority of these increases are targeted for specific programs, projects, and locations.

STAFFING

Mr. Skeen: The ARS budget proposes a funding increase of over $63 million, yet the staffing levels remain the same as fiscal year 2000. Please explain why the funding increase does not support additional ARS staff in fiscal year 2001 and provide an object class breakdown for the funding increase.

Response: The additional staffing needs required to implement the new and expanded research initiatives proposed in fiscal year 2001 will essentially come from the positions associated with the 108 research projects that are being proposed for termination in fiscal year 2001. An object class breakdown for the proposed program increase of $63.9 million is provided for the record. [The information follows:]

Personnel Compensation		
11.0	Personnel compensation	18,264,000
12.0	Personnel benefits	4,432,000
	Total Personnel Compensation and Benefits	22,696,000
Other Services:		
21.0	Travel and transportation	1,222,000
23.0	Rent, communications, utilities	3,731,000
24.0	Printing and reproduction	157,000
25.0	Other services	28,741,000
26.0	Supplies and materials	3,327,000
31.0	Equipment	4,000,000
	Total, All other	41,178,000
	Total	63,874,000

EMERGING DISEASES AND EXOTIC PESTS

Mr. Skeen: The fiscal year 2000 appropriations provided an increase of $3,775,000 for emerging diseases and exotic pests. Please provide a table by location showing the fiscal years 1999, 2000 and 2001 funding and staff devoted to emerging diseases and exotic pests.

Response: Funding and staff devoted to emerging diseases and exotic pests for fiscal years 1999, 2000, and 2001 will be provided for the record.

[The information follows:]

Location	FY 1999	SY	FY 2000	SY	FY 2001	SY
Auburn, AL	$1,913,700	4.0	$1,949,600	8.0	$1,949,600	8.0
Fayetteville, AR	293,800	5.3	549,100	1.3	549,100	1.3
Phoenix, AZ	0	0.0	250,000	1.0	250,000	1.0
Albany, CA	5,482,100	14.0	6,350,000	19.9	7,050,000	21.9
Davis, CA	706,300	2.9	846,200	2.9	818,700	2.9
Parlier, CA	1,280,100	4.0	1,304,400	4.0	1,304,400	4.0
Riverside, CA	734,100	0.8	604,200	2.3	604,200	2.3
Salinas, CA	1,240,600	4.0	1,265,600	4.0	1,265,600	4.0
Ft. Collins, CO	242,100	0.9	246,900	0.9	246,900	0.9
Washington, DC	1,709,700	3.9	1,155,200	3.2	1,155,200	3.2
Canal Point, FL	246,800	1.0	251,800	1.0	251,800	1.0
Ft. Pierce, FL	3,310,300	8.6	3,050,200	9.8	3,050,200	9.8
Gainesville, FL	5,633,400	23.6	6,305,800	24.0	6,405,800	24.0
Athens, GA	10,058,400	26.8	13,237,000	31.7	14,602,000	34.7
Byron, GA	898,800	2.1	915,200	2.1	915,200	2.1
Griffin, GA	165,600	1.0	168,600	1.0	168,600	1.0
Tifton, GA	633,000	2.6	646,400	2.5	646,400	2.5
Manhattan, KS	0	0.0	565,900	2.0	565,900	2.0
Ames, IA	20,570,100	48.3	21,664,400	52.8	23,064,400	57.8
Peoria, IL	1,576,600	1.9	1,692,700	2.2	778,200	2.2
Urbana, IL	670,100	3.5	683,600	2.5	415,800	1.5
West Lafayette, IN	1,223,900	3.8	1,496,700	4.9	1,496,700	4.9
New Orleans, LA	219,300	1.0	223,800	1.0	182,000	0.8
Beltsville, MD	23,072,300	50.0	23,420,800	58.6	23,947,800	58.6
Frederick, MD	1,625,800	6.0	1,656,700	5.8	1,756,400	5.8
East Lansing, MI	2,180,900	7.1	2,225,200	7.1	2,525,200	8.1
St. Paul, MN	1,435,300	5.8	1,628,700	5.7	1,628,700	5.7
Columbia, MO	617,600	2.0	629,500	2.0	629,500	2.0
Mississippi State, MS	969,800	2.9	1,490,800	3.8	1,490,800	3.8
Oxford, MS	277,700	1.0	282,800	1.0	282,800	1.0
Poplarville, MS	0	0.0	637,500	1.0	0	0.0
Stoneville, MS	89,500	0.4	591,200	0.4	499,000	0.4
Raleigh, NC	934,200	4.1	1,028,400	4.1	778,400	3.1
Fargo, ND	925,900	2.9	1,020,000	3.4	944,500	3.4
Clay Center, NE	5,191,600	14.2	6,241,200	17.2	6,541,200	18.2
Lincoln, NE	1,453,700	7.0	1,764,200	6.9	1,971,200	7.9
Ithaca, NY	1,145,700	3.3	1,467,200	3.1	1,165,500	3.1
Orient Point, NY	9,678,300	9.8	11,529,800	10.8	11,130,100	10.8
Wooster, OH	571,400	2.0	585,100	2.0	585,100	2.0
Lane, OK	0	0.0	257,500	0.9	257,500	0.9
Stillwater, OK	187,600	0.5	191,500	0.8	191,500	0.8
Corvallis, OR	1,982,700	5.1	1,606,400	5.5	1,539,800	5.5
Wyndmoor, PA	8,692,900	22.7	9.325,200	28.7	9,625,200	29.7
Charleston, SC	666,500	2.1	680,400	2.1	988,400	3.1
Bushland, TX	0	0.0	250,000	1.0	250,000	1.0
College Station, TX	5,197,300	16.7	5,742,400	16.1	6,042,400	17.1
Kerrville, TX	4,338,500	14.2	4,793,600	14.6	4,793,600	14.6
Lubbock, TX	281,600	0.0	286,900	1.0	586,900	2.0
Weslaco, TX	0	0.0	0	0.0	300,000	1.0
Logan, UT	63,600	0.2	64,700	0.2	64,700	0.2
Prosser, WA	384,200	1.3	392,100	1.3	392,100	1.3
Pullman, WA	3,939,200	11.0	5,038,900	13.0	4,913,900	13.0
Wenatchee, WA	860,000	3.0	879,200	3.0	879,200	3.0
Madison, WI	626,600	3.0	639,200	3.0	526,800	2.0
Kearneysville, WV	677,200	1.8	868,000	3.2	868,000	3.2

Laramie, WY	3,454,700	8.6	3,515,800	9.6	3,515,800	9.6
Panama City, Panama	980,200	3.0	996,500	3.0	996,500	3.0
Headquarters	148,200	0.0	2,608,000	0.0	2,220,500	0.0
Total	141,819,500	371.7	159,758,700	424.9	162,565,700	438.7

Mr. Skeen: Please provide a brief description by location of how these funds are used.

Response: A description of how the funds are used will be provided for the record.

[The information follows:]

Madison, WI	$300,000	Determine the molecular mechanisms of pathogen virulence and plant disease resistance. Develop disease control methods.
Raleigh, NC	$75,000	Characterize the ecology, biology, epidemiology of wheat scab pathogens and devise integrated disease control strategies.
St. Paul, MN	$50,000	Develop improved scab-resistant wheat germplasm.
Peoria, IL	$100,000	Develop transgenic germplasm with resistance to fungal toxins.
Fargo, ND	$250,000	Develop improved resistance to scab in barley and wheat through conventional breeding and biotechnological approaches.
Albany, CA	$50,000	Increase the scab resistance in wheat by developing and applying biotechnology resources and protocols to the molecular alteration of wheat.
Beltsville, MD	$50,000	Develop wheat microsatellite markers and an information database to generate maps for genetic improvement and the assay of genetic variability.
Headquarters	$1,300,000	Provide support to the U.S. Wheat and Barley Scab Initiative for research on the following: Variety development and coordinated screening nurseries; epidemiology and disease management; food safety, toxicology and utilization; biotechnology; chemical and biological control; and germplasm introduction and evaluation.
St. Paul, MN	$75,000	Develop improved disease-resistant wheat germplasm.
St. Paul, MN	$175,000	Characterize the ecology, biology, epidemiology, variability, genetics, and host-plant interactions of rust pathogens. Devise improved integrated disease control strategies.

Ft. Pierce, FL	$250,000	Characterize the biology, epidemology, genetics, and host-plant interactions of pathogens causing diseases on tropical and subtropical crops. Devise integrated disease control methods and improved techniques for pathogen detection and identification.
Stoneville, MS	$500,000	Characterize the biology, genetics, ecology, epidemiology, and host plant interactions of reniform nematodes on cotton and other crops. Devise control strategies for reniform nematode diseases.
Burns, OR	$250,000	Investigate weed ecology, graying management, revegetation, biological control, and other strategies to develop integrated weed management systems in the Great Basin.
Athens, GA	$250,000	Conduct genomics characterization of U.S. avian pneumovirus isolates, determine the reservoirs and sources of avian pneumovirus in the wild bird population, develop new diagnostic tests for avian pneumovirus.
Athens, GA	$100,000	Conduct initial studies in development of vaccines against the new small round virus and determine the ability of a vaccine to protect turkeys against poult enteritis and mortality syndrome.

BIOTERRORISM

Mr. Skeen: The fiscal year 2001 budget requests $10 million for research in exotic diseases (PDD 62) in order to prevent and deal with acts of chemical and biological bioterrorism in agriculture. Please provide an object class breakdown for this funding increase request and an explanation of where this research would likely be conducted, including the needs for any new facilities or facility locations.

Response: The Agency plans to implement the proposed new resources at several inhouse laboratories as well as extramurally. Initially, the program will focus on developing a forensic capability to rapidly identify highly infectious pathogens. This will require extensive genomic databases of highly infectious disease agents. The research will also focus on the accelerated development of vaccines. Other research will focus on improved control strategies for pathogens and insects that pose potential bioterrorism threats. This work will be performed at a number of ARS laboratories and universities. ARS laboratories at Frederick, MD; Athens, GA; Laramie, WY; and Greenport, NY have capability of researching threats that do not requires BL-4 biocontainment capability. The object class breakdown will be provided for the record.

[The information follows:]

		Total
Personnel Compensation		
11.0	Personnel compensation	1,521,000
12.0	Personnel benefits: Civilian Retirement	350,000
	Total Personnel Compensation and Benefits	1,871,000
Other Services:		
21.0	Travel and transportation of persons	376,000
22.0	Transportation of things	45,000

23.0	Rent/Communications	763,000
24.0	Printing and reproduction	31,000
25.0	Other services	4,262,000
26.0	Supplies and materials	1,575,000
31.0	Equipment	1,077,000
	Total, All other	8,129,000
	Total	10,000,000

BIOBASED PRODUCTS

Mr. Skeen: The fiscal year 2001 budget proposes an increase of $14 million to support the increase in number of biobased products. Please provide a location and funding and staffing breakdown of where this increased research would be conducted.

Response: The utilization of the proposed $14 million increase in Biobased products research by location and staffing will be provided for the record.
[The information follows:]

Location	Million Dollars	New SY's
Albany, CA	2.9	8
Athens, GA	0.4	1
Lincoln, NE	0.7	2
Madison, WI	0.4	1
New Orleans, LA	1.3	4
Peoria, IL	4.8	13
St. Paul, MN	0.4	1
Winter Haven, FL	0.4	1
Wyndmoor, PA	2.7	8
Total	14.0	39

Mr. Skeen: Is there any overlap in facilities that are targeted under the budget proposals for project terminations? Please provide a comparison chart of project terminations versus new proposed projects by location.

Response: The agency made a concerted effort to place proposed program increases in fiscal year 2001 in the locations where ongoing project terminations are proposed to offset or reduce the impact of the budget reduction, to the maximum extent possible. A comparison chart of the project terminations versus new proposed projects will be provided for the record.
[The information follows:]

LOCATION/PROJECT	FY 2001 Term./Incr.
ALABAMA, AUBURN	
Fish Diseases Research	(425,005)
CCTI (Climate Change)	300,000
SUBTOTAL, AUBURN	(125,005)
ALASKA, FAIRBANKS (w/s of Albany, CA)	
Global Change	400,000
ALASKA, PALMER (w/s of Pullman, WA)	
Arctic Plant Germplasm Introduction & Research	(650,000)
ARIZONA, PHOENIX	
CCTI (Climate Change)	400,000
Integrated Sciences for Ecological Challenges	300,000
Global Change	750,000
Agricultural Genetics (Plants)	320,000
SUBTOTAL, PHOENIX	1,770,000
ARIZONA, TUCSON	
CCTI (Climate Change)	300,000
ARKANSAS, BOONEVILLE	
CCTI (Climate Change)	600,000
ARKANSAS, FAYETTEVILLE	
Integrated Sciences for Ecological Challenges	300,000
ARKANSAS, LITTLE ROCK	
Human Nutrition Research Initiative	4,000,000
ARKANSAS, STUTTGART	
Aquaculture Research	(501,900)
Rice Research	(425,005)
SUBTOTAL, STUTTGART	(926,905)
ARKANSAS, PINE BLUFF	
Aquaculture Research	(425,005)
CALIFORNIA, ALBANY	
Biological Control of Yellow Starthistle	(86,500)
Conversion of Higher Added Value	(324,500)
Mechanisms of Heavy Metal Chilation	(111,200)
High-Value Carotenoids in Tomatoes	(399,300)
Post Harvest Food Safety (CC&D)	700,000
Biobased Products	2,850,000
SUBTOTAL , ALBANY	2,628,500
CALIFORNIA, DAVIS	
Sustainable Vineyard Practices Research	(212,502)
Emerging & Exotic Diseases (Plants)	100,000
Agricultural Genomes (Plants & Insects)	400,000
Invasive Species (Weeds/Plants)	300,000
Agricultural Genetics (Plants)	350,000
Human Nutrition Research Initiative	2,100,000
SUBTOTAL, DAVIS	3,037,498

LOCATION/PROJECT	FY 2001 Term./Incr.
CALIFORNIA, PARLIER	
Irrigation Water & Crop Management	(246,000)
Air Quality	900,000
FQPA Implementation	310,000
SUBTOTAL, PARLIER	964,000
CALIFORNIA, RIVERSIDE	
Integrated Sciences for Ecological Challenges	300,000
Global Change	300,000
Agricultural Genetics (Plants)	350,000
SUBTOTAL RIVERSIDE	950,000
CALIFORNIA, SALINAS	
Greenhouse Lettuce Germplasm	(212,502)
Lettuce Genetics/Breeding Research	(212,502)
Organic Minor Crops Research	(212,502)
Post-Harvest Research (Lettuce)	(212,502)
SUBTOTAL, SALINAS	(850,008)
COLORADO, FT. COLLINS	
Integrated Sciences for Ecological Challenges	300,000
Global Change	350,000
Agricultural Genetics (Plants)	350,000
Agricultural Genetics (Animals)	1,000,000
SUBTOTAL, FT. COLLINS	2,000,000
DISTRICT OF COLUMBIA, WASHINGTON	
Agricultural Genetics (Plants)	320,000
FLORIDA, FT. PIERCE	
Invasive Species (Weeds/Plants)	300,000
FQPA Implementation	310,000
SUBTOTAL, FT. PIERCE	610,000
FLORIDA, GAINESVILLE	
Behavioral Ecology & Mgmt. of Crop Insect Pests	(166,600)
Integrated Termite Management Strategies	(143,200)
Biological Control Research FAMU	(850,009)
Science Center of Excellence, FAMU	(850,009)
Global Change	450,000
Emerging & Exotic Diseases (Plants)	100,000
SUBTOTAL, GAINESVILLE	(1,459,818)
FLORIDA, MIAMI	
Alternative Crops Research	(425,005)
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, MIAMI	(125,005)
FLORIDA, WINTER HAVEN	
Biobased Products	500,000
GEORGIA, ATHENS	
Asian Bird Influenza Research	(255,003)
Global Change	300,000
Pre Harvest Food Safety (Animals)	960,000
Post Harvest Food Safety (CC&D)	660,000
Biobased Products	400,000
SUBTOTAL, ATHENS	2,064,997

LOCATION/PROJECT	FY 2001 Term./Incr.
GEORGIA, DAWSON	
Improve Efficiency and Quality of Peanuts	(503,100)
Peanut Quality Research	(661,309)
SUBTOTAL, DAWSON	(1,164,409)
GEORGIA, GRIFFIN	
Agricultural Genetics (Plants)	350,000
GEORGIA, TIFTON	
CCTI (Climate Change)	600,000
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, TIFTON	900,000
GEORGIA, WATKINSVILLE (w/s of Athens)	
Air Quality	300,000
HAWAII, HILO	
Development of Shrimp Feeds	(1,603,000)
Pacific Basin Agricultural Research	(425,005)
SUBTOTAL, HILO	(2,028,005)
IDAHO, ABERDEEN	
Enhanced Fish and Feeds for Aquaculture	(251,600)
Agricultural Genetics (Plants)	320,000
SUBTOTAL, ABERDEEN	68,400
IDAHO, BOISE	
CCTI (Climate Change)	300,000
IDAHO, KIMBERLY	
Integrated Sciences for Ecological Challenges	300,000
ILLINOIS, PEORIA	
Animal Health Consortium	(914,400)
Biotechnology R&D Corp. (BRDC)	(1,908,200)
Value-added Products from Seed Proteins	(578,300)
New Crops for Industrial Products	(201,300)
Thermomechanical Processing of Natural Polymers	(161,900)
Invasive Species (Weeds/Plants)	600,000
Pre Harvest Food Safety (Animals)	300,000
Biobased Products	4,700,000
SUBTOTAL, PEORIA	1,835,900
ILLINOIS, URBANA	
Soybean Diseases Research	(267,800)
Global Change	350,000
Agricultural Genetics (Plants)	350,000
SUBTOTAL, URBANA	432,200
IOWA, AMES	
Genetics of Host Resistance in Cereal Crops	(33,600)
Risk Assessment for BT Crops	(170,002)
Integrated Sciences for Ecological Challenges	300,000
Global Change	300,000
Agricultural Genomes (Plants & Insects)	400,000
Agricultural Genetics (Plants)	350,000
Emerging & Exotic Diseases (Animals)	1,000,000
Pre Harvest Food Safety (Animals)	400,000
Agricultural Genomes (CC&D)	300,000
SUBTOTAL, AMES	2,846,398

LOCATION/PROJECT	FY 2001 Term./Incr.
KANSAS, MANHATTAN	
Air Quality	300,000
LOUISIANA, BATON ROUGE	
Integrated Sciences for Ecological Challenges	300,000
LOUISIANA, NEW ORLEANS	
Developing Integrated Weed Mgmt. Systems	(83,400)
Enhancement of Sugarcane Germplasm Resistance	(83,600)
Formosan Subterranean Termite Control & Research	(5,000,000)
Improving Sugarcane Productivity	(233,800)
Improving Sugarcane Productivity	(201,700)
Biobased Products	1,300,000
SUBTOTAL, NEW ORLEANS	(4,302,500)
MAINE, ORONO (w/s of Ithaca)	
New England Plant, Soil & Water Research	(255,003)
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, ORONO	44,997
MARYLAND, BELTSVILLE	
Analysis of Fresh & Fresh-Cut Fruits/Vegetables	(323,300)
Lyme Disease	(176,400)
Lyme Disease/Tick Mgmt Project	(201,600)
Strawberry, Blueberry, & Other Small Fruits	(238,400)
Improving Quality of Fresh & Fresh-Cut Produce	(455,000)
National Turfgrass Evaluation Program	(55,400)
Alternative Crops Research	(85,001)
Lyme Disease, Yale Univ.	(170,002)
Biomedical Materials in Plants Research	(425,005)
CCTI (Climate Change)	600,000
Integrated Sciences for Ecological Challenges	850,000
Global Change	1,050,000
Invasive Species (Weeds/Plants)	950,000
FQPA Implementation	1,417,000
Agricultural Genetics (Plants)	250,000
Emerging & Exotic Diseases (Animals)	300,000
Agricultural Genomes (Animals)	600,000
Pre Harvest Food Safety (Animals)	300,000
Post Harvest Food Safety (CC&D)	1,200,000
Human Nutrition Research Initiative	4,800,000
SUBTOTAL, BELTSVILLE	10,186,892
MARYLAND, FREDERICK	
Emerging & Exotic Diseases (Plants)	100,000
MASSACHUSETTS, BOSTON	
Dietary Assessments of Rural Older Persons	(197,200)
Human Nutrition Research Initiative	1,900,000
SUBTOTAL, BOSTON	1,702,800
MICHIGAN, EAST LANSING	
Post-Harvest Handling of Fruits	(309,600)
Emerging & Exotic Diseases (Animals)	300,000
Agricultural Genomes (Animals)	300,000
SUBTOTAL, EAST LANSING	290,400

LOCATION/PROJECT	FY 2001 Term./Incr.
MINNESOTA, ST. PAUL	
Genetic Improvement of Oats and Wild Rice	(150,400)
Wild Rice Breeding & Germplasm Improvement	(100,000)
CCTI (Climate Change)	600,000
Integrated Sciences for Ecological Challenges	275,000
Agricultural Genomes (Plants & Insects)	450,000
Biobased Products	400,000
SUBTOTAL, ST. PAUL	**1,474,600**
MISSISSIPPI, MISSISSIPPI STATE	
Alternative Crops Research	(85,000)
CCTI (Climate Change)	300,000
SUBTOTAL, MISSISSIPPI STATE	**215,000**
MISSISSIPPI, OXFORD	
Biochemistry & Molecular Biology of Natural Products	(352,100)
Development of Natural Products from Plants & Microbes	(350,000)
Development of Natural Products	(637,507)
Acoustics Research, National Sedimentation Lab.	(42,500)
Yazoo River Basin Research, Nat'l. Sedimentation Lab.	(425,005)
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, OXFORD	**(1,507,112)**
MISSISSIPPI, POPLARVILLE	
Small Fruits Research	(252,000)
Small Fruits Research	(637,507)
SUBTOTAL, POPLARVILLE	**(889,507)**
MISSISSIPPI, STONEVILLE	
Evaluation of Kenaf as a Field Crop	(488,700)
Catfish Genetics and Breeding Research	(251,800)
Genetic-Physiological Parameters that Enhance Fiber Quality	(251,800)
Improve Production Efficiency in Aquaculture	(250,000)
National Warmwater Aquaculture Research	(261,803)
Southern Insect Mgmt Research	(63,751)
Red Imported Fire Ants Research	(297,503)
Invasive Species (Weeds/Plants)	600,000
SUBTOTAL, STONEVILLE	**(1,265,357)**
MISSOURI, COLUMBIA	
Plant Genetics Research	(200,000)
Sensing Technology to Protect Environment	(184,600)
Alternative Cropping Systems	(364,200)
Mid-West/Mid-South Irrigation Programs	(170,002)
Watershed Research	(276,253)
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, COLUMBIA	**(895,055)**
MONTANA, SIDNEY	
Northern Plains Research	(637,507)
Global Change	300,000
SUBTOTAL, SIDNEY	**(337,507)**
NEBRASKA, CLAY CENTER	
Agricultural Genomes (Animals)	600,000
Pre Harvest Food Safety (Animals)	300,000
SUBTOTAL, CLAY CENTER	**900,000**

LOCATION/PROJECT	FY 2001 Term./Incr.
NEBRASKA, LINCOLN	
Genetic Improvement of Sorghum for Feed Quality	(143,400)
Integrated Sciences for Ecological Challenge	300,000
Emerging & Exotic Diseases (Animals)	250,000
Biobased Products	700,000
SUBTOTAL, LINCOLN	1,106,600
NEW MEXICO, LAS CRUCES	
Global Change	300,000
NEW YORK, GENEVA (w/s of Ithaca, NY)	
Grape Rootstock Research	(212,502)
NEW YORK, GREENPORT	
Animal Vaccines Research	(1,700,018)
Emerging & Exotic Diseases (Animals)	1,300,000
Agricultural Genomes (CC&D)	300,000
SUBTOTAL, GREENPORT	(100,018)
NEW YORK, ITHACA	
Maintenance of Fungi & Plants for Pest Control	(50,200)
Maintenance of Fungi & Plants for Pest Control	(100,600)
Golden Nematode Research	(170,002)
Agricultural Genomes (Plants & Insects)	1,000,000
Invasive Species (Weeds/Plants)	950,000
Agricultural Genetics (Plants)	350,000
SUBTOTAL, ITHACA	1,979,198
NORTH CAROLINA, RALEIGH	
Control of Fungal Pathogens of Small Grains	(250,000)
Temperate Legumes and Warm-Season Grass	(375,200)
Improved Peanut Product Quality	(284,200)
Peanut Quality Research	(188,700)
Air Quality	300,000
CCTI (Climate Change)	300,000
SUBTOTAL, RALEIGH	(498,100)
NORTH DAKOTA, FARGO	
Sunflower Research	(170,002)
NORTH DAKOTA, GRAND FORKS	
Human Nutrition Research Initiative	1,600,000
OHIO, COLUMBUS	
Integrated Sciences for Ecological Challenges	300,000
OHIO, COSHOCTON	
CCTI (Climate Change)	300,000
OHIO, WOOSTER	
Development of Soybean Germplasm	(211,200)
OKLAHOMA, EL RENO	
CCTI (Climate Change)	600,000
Global Change	300,000
SUBTOTAL, EL RENO	900,000
OREGON, BURNS	
CCTI (Climate Change)	300,000

LOCATION/PROJECT	FY 2001 Term./Incr.
OREGON, CORVALLIS	
Grass and Legume Seed for Sustainable Systems	(215,000)
Hops Genetics & Breeding	(76,400)
Hops Genetics & Breeding	(72,700)
Horticultural Crop Productivity & Product Quality	(75,300)
Control of Viruses Infecting Small Fruit Crops	(33,300)
Foliage & Fruit Diseases of Horticultural Crops	(33,300)
Biology & Control of Insect Pests of Horticultural Crops	(33,300)
Genetic of Temperate Fruit, Nut, & Specialty Crops	(28,000)
Residue Management and Grass Seed Cropping Systems	(215,400)
Small Fruit and Nursery Research	(516,700)
Viticulture Research	(382,504)
Agricultural Genomes (Plants & Insects)	500,000
Agricultural Genetics (Plants)	350,000
SUBTOTAL, CORVALLIS	(831,904)
OREGON, PENDLETON	
CCTI (Climate Change)	300,000
PENNSYLVANIA, UNIVERSITY PARK	
CCTI (Climate Change)	300,000
Integrated Sciences for Ecological Challenges	300,000
SUBTOTAL, UNIVERSITY PARK	600,000
PENNSYLVANIA, WYNDMOOR	
Post Harvest Food Safety (CC&D)	300,000
Biobased Products	2,750,000
SUBTOTAL, WYNDMOOR	3,050,000
SOUTH CAROLINA, CHARLESTON	
Emerging & Exotic Diseases (Plants)	308,000
Agricultural Genetics (Plants)	320,000
SUBTOTAL, CHARLESTON	628,000
SOUTH CAROLINA, FLORENCE	
Integrated Sciences for Ecological Challenges	300,000
TEXAS, BUSHLAND	
Air Quality	100,000
Integrated Sciences for Ecological Challenge	300,000
SUBTOTAL, BUSHLAND	400,000
TEXAS, COLLEGE STATION	
Agricultural Genetics (Plants)	600,000
Pre Harvest Food Safety (Animals)	300,000
SUBTOTAL, COLLEGE STATION	900,000
TEXAS, HOUSTON	
Human Nutrition Research Initiative	2,850,000
TEXAS, LUBBOCK	
Ginning Technologies for Stripper Cotton	(503,200)
Plant Stress & Water Conservation Research	(637,507)
Pre Harvest Food Safety (Animals)	300,000
SUBTOTAL, LUBBOCK	(840,707)

LOCATION/PROJECT	FY 2001 Term./Incr.
TEXAS, TEMPLE	
CCTI (Climate Change)	600,000
Integrated Sciences for Ecological Challenge	575,000
Global Change	600,000
SUBTOTAL, TEMPLE	1,775,000
TEXAS, WESLACO	
Emerging & Exotic Diseases	300,000
WASHINGTON, PROSSER	
Potato Research Enhancement	(212,502)
WASHINGTON, PULLMAN	
Enhancement of Cool Season Food Legumes	(251,800)
Root Diseases of Wheat/Barley	(425,005)
Air Quality	100,000
Global Change	300,000
Agricultural Genetics (Plants)	350,000
Emerging & Exotic Diseases (Animals)	300,000
SUBTOTAL, PULLMAN	373,195
WASHINGTON, YAKIMA	
Temperate Fruit Flies Research	(212,502)
Invasive Species (Weeds/Plants)	300,000
SUBTOTAL, YAKIMA	87,498
WEST VIRGINIA, BEAVER	
Appalachian Farming Systems Research	(850,009)
CCTI (Climate Change)	300,000
SUBTOTAL, BEAVER	(550,009)
WEST VIRGINIA, LEETOWN	
Cool and Cold Water Aquaculture Research	(212,502)
Aquaculture Systems (Rainbow Trout) Research	(425,005)
SUBTOTAL, LEETOWN	(637,507)
WISCONSIN, MADISON	
Epidemiology of Foliar Diseases	(112,400)
Agricultural Genomes (Plants/Insects)	500,000
Agricultural Genetics (Plants)	320,000
Biobased Products	400,000
SUBTOTAL, MADISON	1,107,600
WYOMING, CHEYENNE	
Global Change	300,000
PUERTO RICO, MAYAGUEZ	
Alternative Crops Research	(85,001)
HEADQUARTERS	
Food Safety & Post Harvest Technology Research	(255,003)
Biobased Products Research	(200,000)
Binational Agricultural Research & Development	(400,000)
Floriculture and Nursery Crop Research	(1,700,018)
Animal Waste Management	(170,002)
Global Change	1,550,000
FQPA Implementation	2,500,000
PDD 62 Implementation	10,000,000
SUBTOTAL, HEADQUARTERS	11,324,977

LOCATION/PROJECT	FY 2001 Term./Incr.
NAL	
Agricultural Information	2,000,000
MONTPELLIER, FRANCE	
Invasive Species (Weeds/Plants)	300,000
TOTAL PROPOSED PROGRAM INCREASES	97,815,000
TOTAL PROJECT TERMINATIONS	(42,441,000)

RESEARCH PROJECTS IN THE BUDGET PRESENTATION

Mr. Skeen: Please provide the Committee with a cross-walk table that shows the placement of research projects that were funded in fiscal year 2000 and noted in the related Conference Report within the seven objectives ARS used to describe the fiscal year 2001 budget request.

Response: A cross-walk table showing the placement of research projects described in the Congressional hearings record within the seven ARS objectives for the fiscal year 2001 budget request will be provided for the record.

[The information follows:]

Projects	ARS Program Objectives						
	SWA	PS	AS	CCD	HN	IAS	AILS
Agricultural Genome		X					
Alternative Replacement Crops		X					
Animal Vaccines			X				
Animal Waste Management	X						
Appalachian Pasture-Beef		X				X	
Aquaculture Research			X	X		X	
Asian Bird Influenza			X				
Binational Agricultural Research & Development (BARD)		X					
Biobased Products		X					
Biological Control & Ag. Research		X					
Biomedical Materials in Plants		X					
Emerging Diseases & Exotic Pests		X	X	X			
Fish Diseases & Parasites Research							
Floriculture & Nursery Crops		X					
Food Safety			X	X			
Global Climate Change	X	X					
Golden Nematode		X					
Grape Research		X					
Greenhouse Lettuce Germplasm		X					
Human Nutrition					X		
Integrated Pest Management		X					
Lettuce Geneticist/Breeder Position		X					
Lyme Disease			X				
Mid-West/Mid-South Irrigation	X					X	
Nat'l Center for Development of Natural Products		X		X			
National Sedimentation Laboratory	X	X					
New England Plant, Soil & Water Res. Lab	X	X				X	
Northern Plains Research Lab	X						
Organic Minor Crop Specialist		X				X	
Peanut Quality Research		X		X			
Post Harvest & Controlled Atmosphere Chamber (lettuce)				X			
Potato Research Enhancement	X					X	
Red Imported Fire Ants		X					
Rice Research		X					
Risk Assessment for BT Crops		X					
Root Diseases of Wheat/Barley		X					
Small Fruits		X					
Southern Insect Management		X					
Sunflower Research		X					
Sustainable Ecosystems	X	X				X	
Sustainable Vineyard Practices Position		X					
Temperate Fruit Flies		X					
U.S. Pacific Basin Agricultural Research Center		X					
U.S. Plant Stress & Water Conservation Lab	X	X					
Watershed Research	X						

SWA - Soil, Water and Air
PS - Plant Sciences
AS - Animal Sciences
CCD - Commodity Conversion and Delivery
HN - Human Nutrition
IAS - Integrated Farming Systems
AILS - Agricultural Information and Library Services

AGRICULTURAL RESEARCH SERVICE

Mr. Skeen: For the ARS projects proposed for termination, please provide by project a table showing the fiscal year 2000 funding, and the funding requested for fiscal 2001 at the Agency Estimates, Department Estimates and President's budget stages of the budget process.

Response: The fiscal year 2000 President's Budget was used as the basis for formulating the fiscal year 2001 budget. Thus, the $35 million in proposed project terminations were assumed out of the fiscal year 2001 base program. ARS did not propose additional project terminations in the fiscal year 2001 Agency Estimates while the fiscal year 2001 Department Estimates requested that the $35 million be restored back to ARS. However, the President's Budget for fiscal year 2001 submitted to the Congress included $42.441 million of proposed project terminations. The project terminations proposed in the fiscal year 2000 budget of $35 million and the project terminations proposed for fiscal year 2001 President's Budget of $42.441 million are being provided for the record.

[The information follows:]

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
FY 2000/2001 Proposed Project Terminations

Base Program	FY 2000	FY 2001
Irrigation Water & Crop Management to Sustain Productivity and Protect Water Quality (Replaces Shallow Groundwater Management Systems for Arid Irrigated Systems)	241,400	246,000
Development and Evaluation of New Remote Sensing Technologies to Assess Food and Fiber Production (Replaces Remote Sensing & Associated Technologies for Production Decisions)	204,900	--
Sensing Technology for Site-Specific Management to Protect Environmental Resources	--	184,600
Improving Surface Water Quality with Alternative Cropping Systems at Field and Watershed Scales	386,300	364,200
Improving Surface Water Quality with Alternative Cropping Systems at Field and Watershed Scales (FY 2000 Watershed Research Incr)	--	276,253
Sensing Technology for Site-Specific Management to Protect Environmental Resources (FY 2000 Mid-West/Mid-South Irrigation Incr)	--	170,002
Potato Production and Disease Management Systems for the Northeast (FY 2000 New England Plant, Soil & Water Res. Lab)	--	178,502
Management of Soil Nutrients and Animal Manure in Cropping Systems (FY 2000 New England Plant, Soil & Water Res. Lab)	--	76,501
Principles of Acoustic Technology in Soil and Sediment Research (FY 2000 Nat'l Sedimentation Lab Incr)	--	42,500
Reducing Water Quality Degradation in the Yazoo River Basin (FY 2000 Nat'l Sedimentation Lab Incr)	--	425,005
Northern Plains Research Lab (FY 2000 Increase)	--	637,507
Novel Germplasm Development for Water-Deficit and Thermal Stress Environments (FY 2000 U.S. Plant Stress & Water Lab Incr)	--	212,503

Base Program	FY 2000	FY 2001
Strategies for Irrigated and Dryland Crop Management in Semi-Arid Climates (FY 2000 U.S. Plant Stress & Water Lab Incr)	--	425,004
Animal Waste Management, IL (FY 2000 Animal Waste Incr)	--	170,002
Cool and Cold Water Aquaculture Production in Appalachia	247,000	--
Impact of Agricultural Management Practices on Soil and Water Quality at the Field and Watershed	500,000	--
Sensors and Systems for Site-Specific Crop Management	225,000	--
Biology and Management of Soilborne Diseases and Beneficial Soil and Root-Inhabiting Microorganisms (Replaces Effects of Beneficial Rhizosphere Microorganisms on Plant Growth and Health (NW Nursery Crops Incr.))	494,000	--
Rice Genetics Research (Rice Research Incr)	345,800	--
Enhancing Rice Grain Quality (Rice Research Incr)	345,800	--
Technology to Enhance Soybean Oil for Food and NonFood Uses (Replaces Modification of Vegetable oils as Raw Materials for Industrial Uses)	669,800	--
Enhanced Production of High-Value Carotenoids in Tomato	391,800	399,300
Ecologically Based Management of Salt Cedar (TamarixSP) in the Western U.S. (Replaces Novel Biopolymers Based on Agricultural Sources)	277,500	--
Biological Control of Yellow Starthistle and Other Non-indigenous Plant Pests in the Western USA	84,900	86,500
Defining the Molecular Mechanisms of Heavy Metal Chilation and Sequestration in Plants	111,100	111,200
Floriculture	196,500	--
Behavioral Ecology and Management of Crop Insect Pests with Semiochemicals	165,100	166,600
Development & Use of Molecular Techniques in Oat Enhancement	157,900	--
Barley and Oat Germplasm Enhancement and Small Grains Germplasm Evaluation and Maintenance (Replaces Conduct and Coordination of Small Grains Germplasm Enhancement and Evaluation (Sm. Grains Res Incr))	98,800	--
Development and Use of Molecular Techniques in Oat Enhancement (Sm. Grains Res Incr)	98,800	--
Reduced Herbicide Inputs for Effective Weed Management Systems to Improve Water Quality	182,400	--
Genetic Characterization of Soybean Germplasm	203,000	--
Quantitative Genetic Analysis and Improvement of Corn Populations (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages	54,900	--
Genetics of Host Resistance to Pathogens in Cereal Crops (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages)	32,900	33,600
Soybean Diseases	337,800	267,800

Base Program	FY 2000	FY 2001
Ecologically-Based Pest Management of Selected Insect Pests of Corn (Replaces Limits to Digestibility & Interactions Among Quality, Growth, & Persistence of Forages)	52,700	--
Genetic Enhancement of Hard Red Winter Wheat for Resistance to Multiple Biotic Stress (Replaces Protecting Hard Red Winter Wheat from Biotic Stress)	245,500	--
Improving Sugarcane Productivity by Conventional and Molecular Approaches to Genetic Development	229,100	233,800
Improving Sugarcane Productivity by Conventional and Molecular Approaches to Genetic Development (FY 1998 Sugarcane Biotech Incr)	197,600	201,700
Disease and Insect Control Mechanisms for the Enhancement of Sugarcane Germplasm Resistance	81,900	83,600
Developing Integrated Weed Management Systems for Efficient and Sustainable Sugarcane Production	81,900	83,400
Physiology of Strawberry, Blueberry and Other Small Fruit Crops in Sustainable Production Systems (Replaces Enhancement of Strawberry, Blueberry, & Other Small Fruit Crops Through Molecular Approaches and Breeding)	236,500	238,400
National Turfgrass Evaluation Program	54,300	55,400
Germplasm Evaluation and Genetic Improvement of Oats and Wild Rice	147,400	150,400
Wild Rice Breeding and Germplasm Improvement	100,000	100,000
Small Fruit Cultural and Genetic Research in the Mid-South (Small Fruits Incr)	247,000	252,000
Genetic-Physiological Parameters that Enhance Fiber Quality (Replaces Development of High Yield, High Quality, & Environmentally Acceptable Cotton Production Systems (Cotton Genetics Incr)	247,000	251,800
Agronomic and Economic Evaluation of Kenaf as a Field Crop in Mississippi	482,800	488,700
Biochemistry and Molecular Biology of Natural Products for Pest Control and Alternative Crops (Natural Products Incr) (Replaces Biologically Active Plant Compounds for Insect Control and Biologically Active Phytochemicals)	691,600	702,100
Plant Genetics Research (Replaces Genetic Mechanisms in Wheat (Plant Genetics Equip/Greenhouse Incr))	197,600	200,000
Genetic Improvement of Sorghum for Feed Quality and Agronomic Fitness (Replaces Biology and Control of Virus Diseases of Sorghum)	140,600	143,400
Exploration and Maintenance of Fungi and Plants for Biorational Control of Agricultural Pests	49,400	50,200
Exploration and Maintenance of Fungi and Plants for Biorational Control of Agricultural Pests (Pear Thrips Incr)	100,000	100,600
Exploration and Maintenance of Fungi and Plants for Biorational Control of Agricultural Pests	133,300	--
Control of Fungal Pathogens of Small Grains (Sm. Grains Incr.)	247,000	250,000

Base Program	FY 2000	FY 2001
Evaluation of Temperate Legumes and Warm-Season Grass Mixtures in Sustainable Production Systems	367,600	375,200
Development of Soybean Germplasm & Production Systems for High Yield & Drought Prone Environments	206,200	211,200
Improving Resistance of Peanut to Biological Stress Through Germplasm and Cultural Enhancement	147,300	--
Germplasm Resources Genetics & Physiology of Grass and Legume Seed for Sustainable Cropping Systems (Replaces Characterization of Induced Cytokinin Changes in Wheat)	211,000	215,000
Physiology, Biochemistry & Genetic Improvement of Horticultural Crop Productivity & Product Quality (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	172,700	75,300
Characterization, Detection & Control of Viruses Infecting Small Fruit Crops (Replaces Partitioning of Photosynthate asInfluenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
Biology & Management of Foliage and Fruit Diseases of Horticultural Crops (Replaces Partitioning of Photosynthateas Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
Biology & Control of Insect Pests of Horticultural Crops (Replaces Partitioning of Photosynthate as Influenced by Genotype, Mycorrhizae & Air Enriched with Co2)	--	33,300
Small Fruit and Nursery Research (Replaces Specific Cooperative Agreements on Horticultural Crops)	319,100	516,700
Hop Genetics and Breeding for Improved Flavor, Agronomic Performance, and Pest Resistance (FY 1998 Hops Research Incr)	71,400	72,700
Hop Genetics and Breeding for Improved Flavor, Agronomic Performance, and Pest Resistance	75,900	76,400
Residue Management and Grass Seed Cropping Systems for Sustainable Agriculture	211,400	215,400
Preservation of Clonal Genetic Resources of Temperate Fruit, Nut, and Specialty Crops	27,400	28,000
Parasite Mite Control in Honey Bee Colonies Utilized in Honey Production and Crop Pollination (Honey Bee Research Incr.)	494,000	--
Genetics and Germplasm Enhancement of Cool Season Food Legumes (Grain Legume Incr.)	247,000	251,800
Arctic Plant Germplasm Introduction and Research (Arctic Germplasm Incr)(Replaces Plant Germplasm Conservation Research (Palmer, AK))	642,000	650,000
The Role of Life Strategies of Phytopathogenic Bacteria in the Epidemiology of Foliar Diseases	111,600	112,400
Genetic Improvement of Rice for Yield, Quality, Pest Resistance and Stress Tolerance (FY 2000 Rice Research Incr)	--	425,005
Sustainable Vineyard Practices Position (FY 2000 Incr)	--	212,502
Evaluation, Enhancement, Genetics and Breeding of Lettuce, Melons and Closely Related Species (FY 2000 Greenhouse Lettuce Germplasm Incr)	--	212,502

Base Program	FY 2000	FY 2001
Evaluation, Enhancement, Genetics and Breeding of Lettuce, Melons and Closely Related Species (FY 2000 Lettuce Geneticist/Breeder Position Incr)	--	212,502
Organic Vegetable and Strawberry Production (FY 2000 Incr)	--	212,502
Development of Biologically Based Mechanisms of Control of Insect Pests of Fruit, Veg, Field Crops FY 2000 Biological Controls & Agric. Research Incr)	--	1,700,018
Development of DNA Markers Associated with Disease Resistance in Cacao (FY 20000 Alternative Crops Incr)	--	425,005
National Tropical, Subtropical Fruit & Nut Crops Germplasm Repository II (FY 2000 U.S. Pacific Basin Ag Research Ctr Incr)	--	425,005
Ecologically-Based Pest Management of Selected Insect Pests of Corn (FY 2000 Risk Assessment of Bt Crops Incr)	--	170,002
Biological Control of the Coffee Berry Borer (FY 2000 Alternative Replacement Crops Incr)	--	85,001
Development of Virus-Based Vectors for Expression of Useful Foreign Genes in Plants (FY 2000 Biomedical Materials in Plants Incr)	--	425,005
Rearing Research in Support of Coffee Berry Borer Biological Control (FY 2000 Alternative Replacement Crops Incr)	--	85,000
Vegetable and Ornamental Research in the Gulf South (FY 2000 Small Fruits Research Incr)	--	637,507
Areawide Management of Cotton Insect Pests in Midsouth Dev of Improved Surveillance & Pest Management Technol. (FY 2000 Red Imported Fire Ant Incr)	--	297,503
Alternative Control Strategies for Insect Pests of Corn and Soybean (FY 2000 So. Insect Mgmt Incr)	--	63,751
Development of Genetically Diverse, Disease Resistant Sunflower Germplasm (FY 2000 Sunflower Research Incr)	--	151,113
Sunflower Germplasm Improvement through the Use of Wild Species &Cytogenetic & Biochemical Technique (FY 2000 Sunflower Research Incr)	--	18,889
Developing Ecologically Sound Means of Managing Nematodes Associated with Potato (FY 2000 Golden Nematode Incr)	--	170,002
Evaluation of Pest, Disease Resistance and Stress Tolerance in Grape Rootstocks (FY 2000 Grape Rootstock Incr)	--	212,502
Production Horticultural and Integrated Management Systems of Grapes (FY 2000 Viticulture Incr)	--	382,504
Rearing Research in Support of Coffee Berry Borer Biological Control (FY 2000 Alternative Crops Research Incr)	--	85,001
Biology and Biological Control of Root Pathogens in Cereal Based Production Systems (FY 2000 Root Diseases of Wheat/Barley Incr)	--	425,005
Research/Management of Tree Fruit Insects (FY 2000 Temperate Fruit Flies Incr)	--	212,502

Base Program	FY 2000	FY 2001
Risk Assessment and Integrated Termite Management Strategies for Hawaii and the Pacific Basin (Replaces Mgt of Termites as Urban Pests in the American Pacific)	141,500	143,200
Tropical Aquaculture Feeds and Culture Technology: Development of Shrimp Feeds (Replaces Aquaculture Productivity Research Phase II)	1,583,800	1,603,000
Development of Genetically Enhanced Fish and Feeds for Aquaculture Utilizing Specialized Grains (FY 1999 Alternative Fish Feed Incr)	250,000	251,600
Formosan Subterranean Termite Control and Research Demonstration Program	5,000,000	5,000,000
Identification and Molecular Characterization of Agents Causing Poult Enteritis-Mortality Syndrome (Poult Enteritis Incr)	247,000	--
Ecologically-Based Technologies for Controlling Ixodes Scapularis and Reducing Lyme Disease	172,900	176,400
Ecologically-Based Technologies for Controlling Ixodes Scapularis and Reducing Lyme Disease	197,600	201,600
Improve Production Efficiency in Aquaculture	247,000	250,000
Identification and Characterization of Quantitative Trait Loci Resistance to Disease in Chicken	167,900	--
Catfish Genetics and Breeding Research (FY 1998 Nat'l W/W Aqua Incr)	247,000	251,800
Animal Health Consortium	903,500	914,400
Immunity and Diagnosis of Diseases & Parasites of Catfish (FY 1998 Fish Disease Incr)	247,000	--
Immunity and Diagnosis of Diseases & Parasites of Catfish (FY 1999 Fish Disease Incr)	250,000	--
Fish Diseases and Parasites Research (FY 2000 Fish Disease Incr)	--	425,005
Improved Aquaculture Production Systems and Products (FY 2000 Aquaculture Incr)	--	425,005
Application of Molecular Biological Techniques to the Control of Avian Influenza (FY 2000 Asian Bird Influenza Incr)	--	255,003
Ecologically-Based Technologies for Controlling Ixodes Scapularis and Reducing Lyme Disease (FY 2000 Lyme Disease Increase)	--	170,002
Catfish Genetics and Breeding Research (FY 2000 Nat'l W/W Aqua. Incr)	--	261,803
Protective Immunity to ASF Virus Infection:Identification of Immunogenic Viral Proteins (FY 2000 Animal Vaccines Incr)	--	1,700,018
Optimizing Reproduction Efficiency to Enhance Profit & Sustainability of Range Beef Production	247,500	--
Metabolism and Nutritional Management of Prolific Sows During Gestation and Lactation (Replaces Influence of Gastrointestinal Neuroendocrine Peptides on Food Intake & Growth of Swine)	204,700	--

Base Program	FY 2000	FY 2001
Conversion of Crops to Products with Higher Added Value Through Directed Molecular Evolution (Replaces New Bacterial Polysaccharides for Food and Industry)	318,500	324,500
Develop, Evaluate, and Transfer Technology to Improve Efficiency and Quality of Peanuts (FY99 Peanut Incr)	500,000	503,100
Bioprocess and Metabolic Engineering Technologies for Biofuels and Value-Added Coproducts	878,200	--
Novel Carbohydrate-Based Materials via Bioconversion Processes	558,000	--
Thermomechanical Processing of Natural Polymers (Replaces Exploratory Thermal Chemical Conversion of Starch to Enhance Derivatization)	158,900	161,900
Development of Value-Added Products from Seed Proteins: Theological Properties Performance (Replaces Enhanced Use of Plant Proteins: Identifying, Isolating and Relating Structures to Properties)	567,700	578,300
Biotechnology R&D Corporation	1,904,700	1,908,200
New Crops for Industrial Products (Meadowfoam Incr)	200,000	201,300
Comparative Textural Analysis of Fresh and Fresh- Cut Fruits and Vegetables	316,900	323,300
Improving Quality of Fresh and Fresh-Cut Produce by Preventing Deterioration in Cold Storage	446,000	455,000
Postharvest Handling & Mechanization to Minimize Damage for Fruits (Replaces Innovation Technology to Improve the Production and Handling of Vegetables)	303,400	309,600
New Processes for Generating Valuable Co-products from Corn Fiber	163,800	--
New Processes for Obtaining Higher Value-Added Products from Agricultural Lipids	250,000	--
Improved Peanut Product Quality and Bioactive Nutrient Composition with Genetic Resources	280,800	284,200
Harvesting and Ginning Technologies for Stripper Cotton	494,000	503,200
Postharvest Pest and Disease Control of Lettuce (FY 2000 Incr)	--	212,502
Develop Technology/Methodology for Peanut Quality Mgmt. During Production & Post-Harvest Processing (FY 2000 Peanut Quality Research Incr)	--	661,309
Development of Natural Products from Plants and Microbes for Replacement of Synthetic Pesticides (FY 2000 Nat'l Center for Dev. Of Natural Products Incr)	--	401,392
Chemistry of Natural Products for Pest Management (FY 2000 Nat'l Center for Dev. Of Natural Products Incr)	--	236,115
Quality Evaluation of Advanced Peanut Breeding Lines (FY 2000 Peanut Quality Research)	--	188,700
Biobased Products (FY 2000 Incr)	--	200,000
Umbrella Project for Food Safety (FY 2000 Ctr for FS/PH Tech Incr)	--	255,003
Value-Added Products from Fruit and Vegetable	679,200	--

Base Program	FY 2000	FY 2001
Processing Wastes		
Pasture Based Beef Systems for Appalachia (FY 2000 Appalachian Pasture-based Beef System Incr)	--	850,009
Binational Agricultural Research & Development (BARD) (FY 2000 BARD Incr)	--	400,000
Floriculture and Nursery Research Initiative (FY 2000 Flor. & Nursery Crop Incr)	--	1,700,018
Genetically Enhanced Wheat for Quality Productivity and Resistance to Biotic and Abiotic Stresses	143,500	--
Biochemical and Molecular Regulation of Preharvest Sprouting and Grain Dormancy in Wheat	66,000	--
Control of Rusts and Smuts of Wheat and Barley (Replaces Control of Foliar Diseases and Smuts of Wheat)	134,300	--
Rice Germplasm and Variety Improvement in the Southern United States (Rice Research Incr.)	247,000	--
Agroforestry Systems for the Appalachian Region (Appalachian Soil & Water Conserv. Lab Incr.)	247,000	--
Warmwater Foodfish Health Management Research (National Aqua Res Ctr Incr)	494,000	501,900
Development of Wheat Biopolymer Composites for Industrial and Food Applications (Replaces Flavor Optimization of Major Food Crops through Control of Metabolic Processes)	351,300	--
Dietary Assessments of Rural Older Persons	187,000	197,200
Improved Aquaculture Production Systems and Products FY 2000 Aquaculture Incr)	--	425,005
Integrated Cropping Systems and Precision Technologies for Irrigated Farming (FY 2000 Potato Research Enhancement Incr)	--	212,502
Cool and Cold Water Aquaculture Production (FY 2000 Aquaculture Research (Rainbow Trout) Incr)	--	212,502
Anaerobic Microbiological Processes in Animal Waste Management	482,100	--
General Reductions	1,199,100	--
GRAND TOTAL	**35,000,000**	**42,441,000**

RESEARCH, EDUCATION, AND ECONOMICS MISSION AREA

QUESTIONS SUBMITTED BY MS. KAPTUR

NEEDS OF THE FARMER

Ms. Kaptur: Secretary Gonzalez, last year we spent some time talking about my perception that your testimony didn't place enough emphasis on the farmer. While the tenor of your several statements taken together is better than last year, I still question where is your recognition of and priorities for the small to medium sized producer, who can't afford thousands of acres or huge herds of livestock. Ms. Offutt's testimony, which acknowledges structural change in the agricultural economy, comes closest to a direct statement about the problems faced by our farmers.

If I am a small hog producer or a tomato grower in the 9th District of Ohio, what is in your budget that will help me to remain competitive, and have a chance to prosper and grow? How does your budget address my needs? And if I am a row crop producer from one of the plain states who has heard about Freedom to Farm and the idea that I should have the ability and desire to plant alternative commodities, what are the agencies under your jurisdiction doing collectively to help me change my production practices and produce mix for the demands of the 21st century?

Response: In different ways, all four of the REE mission area agencies carry out programs that support the desire for small and medium sized farmers to prosper and grow and in that process to adjust their production practices and product mix to the market in the 21st century. These activities involve research and analysis, statistics, education, and extension. For example, the statistics and economic analyses of ERS and NASS focus on the current and future markets in which all producers, including small and medium sized producers, operate. The 1997 Census of Agriculture and other surveys conducted by NASS provide a wealth of information on small and medium sized farms that is vital for understanding the nature of such farms and their role in the agriculture sector and the rural economy. NASS' FY 2001 budget proposes an increase to expand their Hogs and Pigs report to a monthly basis in keeping with swine report provisions included in the FY 2000 agricultural appropriations bill. ERS carries out analysis and publishes regular reports on commodity markets and prospects, as well as conducting studies of policy options, such as their analysis of different approaches to dairy policy. NASS and ERS, together with other USDA agencies, are responsible for the USDA commodity market information system, that provides a critical information base for farmers of all sizes, as well as agribusinesses and state and Federal policy makers. Information may be used by farmers and producers to help determine market growth areas, to identify potential new markets for agricultural products, and to further understanding of market performance and trends.

The small farm research conducted by ARS focuses on developing improved genetic lines and new plant varieties that will be available to producers of all sizes through breeding companies, public breeders and the seed industry and on enhancing production practices. While the specific research objectives vary with the animal or crop, the overall objective is to develop enhanced agricultural products and production practices for all producers that result in high quality and safe food and fiber products. For example, ARS is developing preharvest

intervention strategies needed by hog operations of all sizes to insure a safe food supply. ARS is also conducting research to develop new crops and production practices for alternative crops that often provide niche market opportunities for smaller farms. ARS' research success on milkweed is an example of the development of value-added products from nontraditional crops. Milkweed, commonly known as a perennial weed, is now valued for its fiber which is popular as a filling for comforters and pillows and milkweed seedmeal that can be used as a methyl bromide alternative to control nematodes.

CSREES' FY 2001 budget proposal contains several programs relating to the competitiveness of small and medium sized farms. Under the Integrated Activities section, the budget proposes a new Small Farms Initiative and a new Organic Transitions Program which would fund research, education, and extension activities to assist farmers change to organic production techniques in order to take advantage of the price premiums offered by the organic market. Also under the Integrated Activities, the Biobased Products programs would support research and extension to assist producers to grow crops for new markets such as bio-lubricants, as well as to develop entirely new crops for non-traditional markets. These new programs are targeted specifically at small farm issues and farm diversification. In addition, the budget requests increases for the Sustainable Agriculture research and extension programs specifically targeted for organic production, providing further assistance to producers for whom diversification of their farming operation potentially provides an opportunity for growth and increased competitiveness.

The main competitive grant programs of CSREES also are relevant to small producers. The National Research Initiative funds projects that bridge the biological, physical, and social sciences in support of small and mid-sized farms. The Initiative for Future Agriculture and Food Systems' Request for Proposals, published on March 6, 2000, contains solicitation for integrated research, education, and extension proposals specifically targeting the needs of small-scale producers and addressing such topics as risk management, enterprise diversification, and management alternatives.

The CSREES FY 2001 budget proposes a small increase to facilitate coordination of small farms activities across the Department on a permanent basis. The staff supported with these funds would work through the USDA Council on Small Farms and with mission area and agency small farms coordinators to coordinate small farm activities, analyze program effects, develop new strategies, and report on Department progress.

INTERNATIONAL AGRICULTURE

Ms. Kaptur: Noting that one of the goals of ARS is "An Agricultural System that is Highly Competitive in the Global Economy", what is it you believe we need to be doing now that we are not doing? Are there specific research tasks, facilities and equipment development, or other similar matters we should know about?

Response: The American agricultural system must be efficient, sustainable and the producer of high quality products. The system must also offer innovative products to the market that meet the needs of consumers. American farmers in some cases may need to certify that their production system meets specific criteria especially for the production of safe foods.

ARS conducts research to meet each of these needs. Our research on germplasm, genomics and production systems, addresses the questions of developing a highly efficient production system that offers high quality products in the market place. The quality and safety of products is assured by post-harvest processing studies as well as pre-harvest. We develop procedures to insure that U. S. farmers will be able to market their products under strict rules imposed in foreign marketplaces for food safety and quality. We conduct research to develop new products for American farmers both at the farm level and as a result of post-harvest processing. At the same time, we conduct research on the management of our soils to prevent erosion and to improve their quality by best management practices. We conduct this research to provide farmers with sustainable practices that will allow them to farm competitively far into the future.

Hygenic standards are one of the critical issues of international competitiveness. The nation must provide research to insure that our products meet these standards. An example of recent ARS research in this area is the development of sorting devices for pistachios to meet European standards for aflatoxin contamination. An example of a need is the building of a joint APHIS-ARS facility in Ames, Iowa to conduct research and diagnostics on animal disease and food safety issues that might restrict U.S. trade in animal products. ARS and APHIS have requested $9,000,000 in fiscal year 2000 to initiate planning for the facility.

BIOBASED FUELS

Ms. Kaptur: You describe your interest to develop and promote biobased products and bioenergy. How does this work expand upon what we already know about the production of ethanol?

Response: Proposed ethanol-related research in ARS would focus on discovering microorganisms and enzymes that would more efficiently convert biomass and multiple sugars to ethanol, thus reducing the cost of ethanol production. Valuable coproducts will also be developed to reduce ethanol costs. Improved sustainable production systems and methods for harvesting, handling and storing biomass crops are designed to expand and improve ethanol feedstocks. Biomass crops will be genetically improved to facilitate conversion of biomass to ethanol and other biobased products.

GENOME INITIATIVE AND SEED STOCK

Ms. Kaptur: You are rightly interested in preserving genome information. Where will this information be stored, in what format, and how will it interconnect with the data we already have on seeds?

Response: Crop genome-related research is generating a vast quantity of information, including: genetic and cytogenetic maps; genomic probes; nucleotide sequences; genes, alleles and gene products; associated phenotypes; quantitative traits and QTLs; genotypes and pedigrees of cultivars; genetic stocks and other germplasm; pathologies and the corresponding pathogens, insects, and abiotic stresses; and metabolic pathways. To be most useful, ideally those data would be accompanied by taxonomic information, addresses and research interests of colleagues; employment opportunities; meeting announcements; discussion topics; relevant bibliographic citations; and links to other sites.

This vast information will be stored in the crop genome database listed below. These databases may be in the AceDB, Oracle, or Sybase format; but all have been written and configured to be mutually intelligible. The databases are delivered through the Internet-based World Wide Web, and connected through hypertext links and other software mechanisms.

The USDA/ARS genome database management program is centered at the new USDA/ARS Center for Bioinformatics and Comparative Genomics at Cornell University, Ithaca, NY. Five USDA/ARS scientists and other support staff at Ithaca and Geneva, NY, and staff from the Cornell Department of Plant Breeding and Biometry and the Cornell Center for Theory and Simulation in Science and Engineering (the Computer "Theory Center") will be involved. The Theory Center provides a high-performance computing environment (at present, a 160-processor IBM RS/6000 POWERParallel System) to advance and facilitate research. It stays at the forefront of high-performance computing, visualization, and computational algorithms and methodologies, and their application to large-scale research problems, such as genome analyses. Consequently, the partnership with Cornell University provides an opportunity for USDA/ARS to leverage its in-house base funds to secure highly cost-effective access to supercomputer capabilities and advanced bioinformatics expertise that will be so important for analyzing genomic data generated by USDA/ARS and its cooperators.

In addition to the "central hub" at Ithaca, prominent nodes in USDA/ARS's genome database efforts include Albany, CA (small grains database curation); Columbia, MO (maize [corn] database curation); Ames, IA (soybean database curation); and Davis, CA (forest trees, sunflower, and lettuce database curation). These nodes benefit from strong cooperation from local university partners, e.g., University of California, Davis; University of Missouri; and Iowa State University. The USDA/ARS germplasm database (Germplasm Resources Information Network) is maintained at Beltsville, MD and is linked to a variety of the crop genome database by hypertext and other software linkage mechanism.

Genome Databases Developed, Maintained, or Supported by USDA/ARS:

"Major" Crop Genome Databases
GrainGenes (Wheat, Barley, Oat, Rye, and Sugarcane Genome Database)
http://ars-genome.cornell.edu
MaizeDB (Maize Genome Database)
http://ars-genome.cornell.edu
RiceGenes (Rice Genome Database)
http://ars-genome.cornell.edu
SolGenes (Solanaceae Database)
http://ars-genome.cornell.edu
SoyBase (Soybean Genome Database)
http://ars-genome.cornell.edu

"Minor" Crop Genome Databases
Alfagenes (Alfalfa Genome Database)
http://ars-genome.cornell.edu
Beangenes (Phaseolus and Vigna Genome Databases)
http://ars-genome.cornell.edu
Coolgenes (Pisum, Lens, Cicer, Lathryus, and Vicia faba Genome Databases)
http://ars-genome.cornell.edu
Cotton DB (Gossypium hirsutum Genome Databases)
http://ars-genome.cornell.edu
SorghumDB (Sorghum Database)
http://ars-genome.cornell.edu
TreeGenes (Pine, Spruce, Poplar and other Trees Databases)
http://ars-genome.cornell.edu
RoseDB (apple, cherry family database)
http://ars-genome.cornell.edu

Genetic Resources Databases
Germplasm Resources Information Network (Plants, Animals, Microbes, Invertebrates)
http://www.ars-grin.gov

Ms. Kaptur: This is a key question for me. While I know there is a major seed-storage facility at Fort Collins, there are other facilities. Can you detail for me the main seed storage facilities in the United States, how those operating conditions differ from what we already have at Fort Collins, and also identify other major foreign sources of seed stock? Also, identify what proportion of seed is held in public v. private ownership?

Response: The National Seed Storage Laboratory (NSSL) at Ft. Collins, CO, is the long-term storage site for plant germplasm-primarily in the form of seed, but also some cuttings and buds-held by the U. S. National Plant Germplasm System (NPGS). It contains the so called "base collection," which will hold duplicates of all the germplasm in the NPGS. Seeds are held at very low temperatures and low humidity, and some are cryopreserved at ultracold temperatures. Researchers at NSSL also conduct studies to develop optimal long-term germplasm storage technology.

The NSSL is one component of the NPGS, a system of plant germplasm collections maintained by ARS at more than 20 sites in cooperation with the State and private sector. In addition to managing seeds and orchards, some sites like the NSSL perform special NPGS-wide functions. One research unit in Beltsville, MD, specialized in managing the large database (called the Germplasm Resources Information Network; (GRIN) that contains key descriptive data for all the germplasm in the NPGS. Another research unit at Beltsville specializes in plant exchange, especially plant collecting expeditions to other nations. Still another research unit in Beltsville serves as the central quarantine facility for importing germplasm of crops into the NPGS which require quarantine inspection and treatment.

As mentioned above, the primary mission of the NSSL is long-term storage of NPGS germplasm, and research on improving technology for achieving that mission. Thus, the NSSL operations emphasize the preceding areas. The other NPGS sites that manage germplasm conserve "active collections," so called because they distribute germplasm directly to scientists, breeders, and educators. At the active sites, germplasm managers increase the number of seeds or plants, test their disease and physiological status, identify unknown variants and characterize their genetic content, evaluate them for horticultural and agronomic utility, and conduct some of the early stages of crop improvement with these materials. The managers also update crop-specific components of GRIN so that its data are current. The NPGS sites, and the crops that they manage, are listed:

Palmer, AK	-crop germplasm adapted to high latitudes, native Arctic germplasm
Davis, CA	-almond, fig, grape, kiwi, mulberry, olive, persimmon, pistachio, pomegranate, stone fruit, walnut, and tomato genetic stocks.
Riverside, CA	-citrus and related genera, and dates.
Parlier, CA	-arid land regeneration site.
Salinas, CA	-lettuce genetic stocks.
Fort Collins, CO	-base seed collection of major economic crops, base collection of apple bud wood.
Washington, D.C.	-woody landscape genera.
Miami, FL	-Annona, avocado, mango, Passiflora, sugarcane, Tripsacum, tropical and subtropical ornamental and medicinal plants.
Griffin, GA	-cowpea, watermelon, peanut, capsicum pepper, sorghum, warm season forage and turf grasses, tropical and subtropical legumes, annual clovers, mung bean, sesame, okra, eggplant, tropical squash, and sweet potato.
Tifton, GA	-pearl millet.
Hilo, HI	-acerola cherry, atemoya, breadfruit, carambola, guava, litchi, lychee, macadamia, papaya, passion-fruit, peach palm, pili nut, pineapple, and rambutan.
Ames, IA	-maize, melon, cucumber, carrots, spinach, amaranths, sweet clovers, temperate zone millets, oilseed brassicas, sunflower, cuphea, ornamentals, mints, umbels, flax, and soybean genetic stocks.
Aberdeen, ID	-barley, barley genetic stocks, oat, rice, rye, triticale, and wheat and its wild relatives.
Urbana, IL	-maize genetic stocks and soybean and its wild annual and perennial relatives.

Columbia, MO	-triticale and wheat genetic stocks.
Oxford, NC	-tobacco.
Fargo, ND	-durum wheat genetic stocks.
Ithaca, NY	-apple, vegetable brassicas, onion, buckwheat, radish, celery, sour cherry, hardy grape, squash, and tomato.
Columbus, OH	-herbaceous ornamental (floricultural) germplasm
Corvallis, OR	-blackberry, blueberry, cranberry, currant, filbert, gooseberry, hop, mint, pear, raspberry, and strawberry.
Mayagüez, PR	-bamboo, banana, plantain, sapotaceous tree fruit, tropical ornamentals, sorghum, tropical quarantine site.
College Station, TX	-cotton and cotton genetic stocks, sorghum genetic stocks, chestnut, hickory, and pecan.
Logan, UT	-temperate zone range grasses, especially annual and perennial Triticeae.
Pullman, WA	-alfalfa, bean, chickpea, vicias, lupines, beets, lettuce, cool season grasses, lentil, onion, pea and pea genetic stocks, clovers and other forage legumes, and safflower.
Madison, WI	-potato

A number of nations maintain large and diverse major collections, including Australia, Brazil, Bulgaria, Canada, China, Colombia, the Czech Republic, Ethiopia, France, Germany, Hungary, India, Israel, Italy, Japan, Kenya, Republic of Korea, Mexico, the Netherlands, New Zealand, the Nordic countries, Peru, the Philippines, Poland, Romania, Russia, South Africa, Spain, Turkey, Ukraine, the United Kingdom, Yugoslavia, and Zimbabwe.

Large crop-specific collections are also held at international agricultural research centers (IARCs) of the Consultative Group on International Agricultural Research (CGIAR) in developing countries. Major crop-specific germplasm collections at IARCs and their locations will be provided for the record.

Crop	Location and Organization
Banana	Montpellier, France--International Network for the Improvement of Bananas and Plantains.
Barley	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Bean	Cali, Colombia--International Center for Tropical Agriculture.
Cassava	Cali, Colombia--International Center for Tropical Agriculture and Ibadan, Nigeria--International Institute for Tropical Agriculture.
Chickpea	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics, and Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Cowpea	Ibadan, Nigeria--International Institute for Tropical Agriculture.
Fava bean	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Lentil	Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Maize (Corn)	El Batan, Mexico--International Center for Maize and Wheat Improvement.

Peanut	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Pearl Millet	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Pigeon pea	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Potato	Lima, Peru--International Potato Center.
Rice	Los Baños, Philippines--International Rice Research Institute, and Bouake, Cote d' Ivoire--West Africa Rice Development Association.
Sorghum	Hyderabad, India--International Crops Research Institute for the Semi-Arid Tropics.
Sweet potato	Lima, Peru-International Potato Center.
Wheat and Triticale	El Batan, Mexico--International Center for Maize and Wheat Improvement, and Aleppo, Syria--International Center for Agricultural Research in the Dry Areas.
Yam	Ibadan, Nigeria--International Institute for Tropical Agriculture.

With the exception of special collections conserved at the request of other governmental or international institutions (e.g., seeds held as legal vouchers for varieties protected by Plant Variety Protection Certificates) all of the germplasm managed in the National Plant Germplasm System is in the public domain. Nearly all of the germplasm held in genebanks by the international agricultural research centers is also in the public domain, as is the case for germplasm in genebanks in the developing world. The genebank systems of some developed nations, especially in Europe, have undergone recent transitions to a quasi-private sector or private sector status. The status of those collections is changing so rapidly at present that it is uncertain whether they should be categorized as in the public or the private domain.

Ms. Kaptur: How do these various programs cooperate and integrate their data so that this information is constructively available to those who need it?

Response: The National Plant Germplasm System (NPGS) integrates its data and makes it available to users through its central database, the Germplasm Research Information Network (GRIN). This database has two primary roles/objectives: 1) provide a sophisticated genebank inventory management system for the 430,000 + accessions of plants in the NPGS, and 2) deliver scientific data associated with plant germplasm to scientists, breeders, and educators worldwide (e.g., taxonomic identification, ecogeographical location, agronomic merit).

The primary users of GRIN are plant scientists worldwide, and NPGS genebank managers. It is accessible by the World Wide Web, or in the form of pcGRIN, a "stand-alone" version implemented on individual PCS. GRIN on the World Wide Web at http://www.ars-grin.gov now receives more than 4,000 "hits" per day. pcGRIN is now widely used in developing nations to manage genebanks. It has been translated into Spanish, and was adopted by Canada and India as the database management system for their national systems of genebanks. Because these nations have adopted GRIN, their germplasm databases will be highly compatible with that of the NPGS.

The genebanks at the international agricultural research centers use the System-wide Information Network for Genetic Resources (SINGER; at http://singer.cgiar.org) database to manage germplasm-related data. There are various links established between SINGER and GRIN that facilitate data integration, exchange, and cooperation in general.

Ms. Kaptur: For the record, can you tell me for each of the past five years the number of seeds approved for release, how many are public or private patent, identify the top seeds in terms of their usage, and describe for us the main preconditions traditionally applied for the use of private-patent seed stock?

Response: In 1995, USDA/ARS released 64 new varieties; in 1996, 56 varieties; in 1997, 89 new varieties; in 1998, 63 new varieties, and in 1999, 84 new varieties. All of these releases were of public varieties, and most were joint releases with cooperating land-grant universities. During this period, plant patents (which cover mainly the right to propagate clonal varieties) were sought for six varieties, and plant variety protection certificates were sought for six varieties, again, mostly in conjunction with land-grant university cooperators. No applications for standard utility patents were filed for USDA/ARS varieties.

Following their release, USDA/ARS does not track the actual usage of released seeds quantitatively because collecting meaningful data would be infeasible because of the way much of this material is distributed. For example, following release, an aliquot of the varietal material, often a joint release with a land-granting university, is often transferred to a land-grant university foundation seed organization for increase prior to broadscale distribution.

The preconditions relevant to the use of "private-patent" seed stock vary according to the type of patent protection, and the terms the owner may stipulate. For example, seed that is protected by a Plant Variety Protection Certificate may be used in breeding, and may be propagated for the buyer's personal use, but cannot be sold without the owner's permission. Seed that is protected by a standard "utility patent" cannot be used in breeding or propagated except with the owner's permission. Vegetatively-propagated germplasm that is protected by a Plant Patent may be propagated only with the owner's permission. Germplasm protected by contracts, trade secrets, trademarks, and other mechanisms also requires the owner's permission. Protected germplasm may be licensed exclusively to one or few parties, or it may be broadly licensed to a wide variety of licensees.

NUTRITION RESEARCH

Ms.Kaptur: Dr. Horn, you referred to work done to maintain the Nutrient Database for nutrients used in managing Federal nutrition programs. How does this work match up with the Food Pyramid and other elements of the developing dietary guidelines? How much were you consulted in the process of developing, testing, and verifying those guidelines?

Response: Research conducted at ARS is used in support of action agencies, such as the Food, Nutrition and Consumer Services. The results of research from ARS Human Nutrition Research Centers has been used in support of dietary

guidance and the development of dietary policy. In addition, ARS scientists publish their findings in peer-reviewed journals, which can be utilized by any Agency or advisory panel, such as the Dietary Guidelines Advisory Committee. Since 1992, USDA's Food Guide Pyramid has been the primary educational tool to help consumers translate the Dietary Guidelines for Americans into food choices for a healthy diet. Data used in support of the types of foods people consume were obtained from ARS' Consumer Survey of Food Intakes by Individuals (CSFII). The National Nutrition Monitoring and Related Research Act of 1990 (P. L. 101-445) calls for the Secretaries to review and approve dietary guidance for the general population prior to release. The purpose is to ensure that Federal dietary guidance is consistent with the Dietary Guidelines for Americans or is based on new medical or scientific knowledge determined to be valid by the Secretaries. Research conducted at ARS Human Nutrition Research Centers is used in support of dietary guidance and the development of dietary policy. For example, research conducted at our Human Nutrition Centers was used to develop previous, and the one currently under review, Dietary Guidelines for Americans. ARS research plays a pivotal role in the development of this document. The Food Guide Pyramid is based on USDA's research on what foods Americans eat, what nutrients are in these foods, and how to make the best food choices.

GREENHOUSE RESEARCH

Ms. Kaptur: As you know, there is a significant greenhouse industry within my district. The production of bedding plants is a significant economic activity. What research does ARS have that is related to this kind of greenhouse industry work?

Response: The USDA/ARS conducts greenhouse/bedding plant research as part of its $11.7 million (fiscal year 2000) research program in floral and nursery crops, conducted at a dozen sites throughout the U. S. Much of this research is pursued in close collaboration with industry and university partners. The primary objectives for this program include: 1) improving environmental and resource management practices and strategies for floral and nursery crops; 2) developing superior pest (insect, disease, and weed) control practices and strategies for floral and nursery crops; and 3) refining nursery and floricultural production system practices and strategies for floral and nursery crops and turfgrasses.

USDA/ARS research efforts that are particularly relevant to the greenhouse bedding plant industry include:

Washington, D.C.: Approximately 65% of the resources the USDA/ARS budgets to floral and nursery crop research is allocated to the Floral and Nursery Plant Research Unit, U.S. National Arboretum (USNA) in Washington, D.C., with satellite locations at Beltsville and Glenn Dale, MD and McMinnville, TN. Its mission is to conduct research on floral and nursery crops, provide education, and to conserve and display plants to enhance the environment, and for scientific and educational purposes. Some of the ornamental herbs found throughout the U. S. were developed by scientists at the USNA and distributed to the American public through the floral/greenhouse industries. The NA also has a very strong program of research in characterizing and devising control strategies for a variety of plant pathogens, especially viruses, that infest bedding plants. Similarly, USNA entomologists and plant pathologists are

conducting research on managing whiteflies, leafhoppers and other ornamental plant pests, including finding alternatives to methyl bromide, and identifying pesticides for "minor use" with ornamental plants. Finally, NA scientists are applying the latest biotechnological tools, such as plant transformation, to improve the overall horticultural merit of ornamental plants, especially of bedding plants, cut flowers and potted plants.

Miami, FL: The USDA/ARS Subtropical Horticulture Research Station (SHRS) in Miami manages plant genetic resources of nearly 400 different species, some of which display potential merit as landscape, potted, and bedding ornamental plants for the tropics and subtropics. Staff members at the SHRS acquire, maintain, distribute, characterize, and evaluate ornamental germplasm, especially plants that can withstand the severe insect and disease pressures of subtropical and tropical environments, so as to expand the range of useful plants in the nursery trade that are adapted to this region.

Orlando, FL: The USDA/ARS research program in Orlando will conduct research on managing waste water produced by large-scale production of ornamental and citrus crops. This new program will thereby address groundwater quality, one of the most important environmental issues in Florida. Current USDA/ARS research in Orlando that addresses floral and nursery crops involves development of biological control and IPM technology to control exotic insect pests in subtropical ornamental species.

Beltsville, MD: At this location, the USDA/ARS's research program in floral and nursery crops stresses control of diseases and pests. Specifically, ARS scientists at Beltsville are developing new means of controlling white flies, pathogens such as viruses, viral satellites, viroids, phytoplasmas, spiroplasmas, walled bacteria, and fungi. The discovery, development, and implementation of beneficial soil microorganisms to diminish or prevent infection of economic crops by soilborne pathogens receive particular attention, as does developing strategies for developing host-specific plant pathogens for the biological control of targeted undesirable plants or agriculturally important weeds. The research program at Beltsville also involves discovering alternative pesticides to methyl bromide, and participation in an interlocational project to identify pesticides suitable for specialty, low acreage crops such as many ornamental plants.

Columbus, OH: The Ohio State University and USDA/ARS have established a new Ornamental Germplasm Center with funds allocated for that purpose by Congress in fiscal year 1999 and fiscal year 2000. This center will emphasize conservation and improvement of genetic resources (germplasm) of herbaceous ornamental, especially those grown as bedding plants and potted plants.

Wooster, OH: The USDA/ARS's Application Technology Research Unit (ATRU) at Wooster, Ohio, conducts basic and developmental research on new or improved application technology (generally spray or injection methods for pesticides) to protect horticultural and landscape crops against damage from pests and adverse environmental conditions, while safeguarding environmental quality and worker safety. Scientists there also develop more effective production and handling systems for nursery and greenhouse industries, especially more effective and safe management of pathogens and pests that cause nursery quarantine problems. This effort includes developing minor use pesticides for ornamental plants.

Corvallis, OR: The USDA/ARS Horticultural Crop Research Unit (HCRU) at Corvallis, OR is, with the U. S. National Arboretum, one of the primary centers for the USDA/ARS's research effort in floral and nursery crops. The HCRU investigates fundamental aspects of the physiology and pathology of a wide range of horticultural crops, emphasizing stress and flowering physiology, breeding and genetics, cultural and biological control of diseases, and the biology and application of beneficial microorganisms, especially mycorrhizal fungi and rhizobacteria. Researchers are developing the technology to isolate and characterize beneficial microbes for inoculating horticultural crops in the nursery/greenhouse production or transplant phase. Integrated production systems for nursery transplants are under development that encourage the establishment of a beneficial microflora from the time of plant propagation. Other components of the HCRU's research involve determining the biology and key epidemiology and environmental factors influencing insect pests of nursery and greenhouse crops, evaluating various fungicides, insecticides, and herbicides for phytotoxicity and/or efficacy on floral and nursery crop plants in support of label expansion through the IR-4 Regional Project.

Part of the $3.2 million that was allocated to USDA/ARS as part of the Floriculture and Nursery Crop Environmental Horticulture Research Initiative is transferred to universities to support research of direct relevance to bedding plant/greenhouse production:

Cornell University: Research programs supported by USDA/ARS here include developing transgenic resistance to thrips in bedding plants and cut flowers and exploring the interactions between irrigation systems, soil nutrition, root rots, and insects in potted and bedding plants.

University of California (Riverside and Davis): Research programs supported by USDA/ARS include biocontrol of giant whitefly (UC-Riverside), a serious pest of nursery and greenhouse plants, and integrated pest management with reduced risk pesticides on ornamental crops (UC-Davis).

Ms. Kaptur: What are the most significant needs for greenhouse research?

Response: The most significant needs for research on greenhouse-grown bedding plants, and greenhouse ornamental plant production in general, has been well-articulated by the joint Society of American Florists/American Nursery and Landscape Association Floriculture and Environmental Horticulture Research Initiative:

--Protect the environment, including human health and safety, through research leading to reduced use of chemicals and a reduction in runoff and other wastes.

--Enhance environmental remediation and cleanup efforts on wetlands, post-industrial sites, air quality and other environmental areas through research on the ability of plants to reverse and mitigate environmental pollution.

--Conduct research to improve the ability to prevent the spread of plant pests and diseases in international trade.

--Strengthen rural and suburban economies across the U.S. by conducting research providing improved crop production systems and technologies to growers and helping them to increase production efficiency.

--Contribute to the U.S. agricultural economy and increase U.S. competitiveness in international markets by conducting research leading to improved nursery/greenhouse and floriculture products and production strategies, and by improving technology transfer of research results to benefit other U.S. agricultural sectors.

--Maintain biodiversity through germplasm preservation enabling useful botanic traits to be transmitted to future generations.

--By maintaining biodiversity, enhance Americans' quality of life by increasing the availability and diversity of plants and flowers for the consumers' purchase and enjoyment.

In summary, research proposed by the joint nursery and floral industry research initiative seeks to accomplish these goals by focusing on improvements in three essential research areas: (1) environmental and resource management; (2) pest management; and (3) production systems and strategies. These are all primary research needs for the greenhouse segment of the industry.

Finally, some industry leaders have indicated the need for bedding plant performance evaluations of a regional and national scope funded and conducted by the public sector. It is thought that such public sector research efforts would provide more truly unbiased information for the grower and consumer than is currently available.

Ms. Kaptur: What might be some of the coming economic opportunities for greenhouse production?

Response: Economic opportunities abound for greenhouse production of bedding plants and other floricultural products. According to the USDA National Agricultural Statistics Service (NASS), the nursery and greenhouse industry remains the fastest growing U.S. agricultural sector in cash receipts. The 1997 Census of Agriculture shows that nursery, greenhouse and floriculture crop sales totaled $10.9 billion in 1997, up from $7.6 billion in 1992. This represents a 43 percent increase in sales over the previous Census. Together these crops make up 11 percent of total U.S. farmgate receipts, up from 10 percent in 1992. Floriculture farms, most of which involve greenhouse production, numbered 21,824. USDA-NASS reported a 40.2% increase in greenhouse space available for production since 1996, which closely resembles the 42% jump in greenhouse grower numbers during that period.

Nursery and greenhouse crops are now the third largest plant crop - behind only corn and soybeans, and surpassing wheat, cotton, and tobacco. Nursery and greenhouse crop production now ranks among the top five agricultural commodities in 24 states, and among the top 10 in 40 states. According to USDA-NASS, growers produce thousands of varieties of cultivated nursery, bedding, foliage and potted flowering plants in a wide array of different forms and sizes on 390,200 acres of open ground and 678 million square feet

under the protective cover of permanent or temporary greenhouses. USDA-NASS data from 1990 also show that nursery and greenhouse farms had the highest average net farm income of all agricultural commodity groups at $53,589. This was four times higher than the average American net farm income in 1990 of $13,458.

In the words of one industry specialist, the bedding plant/garden (which uses much greenhouse production) segment is "propelling" the growth in floriculture described above. The bedding plant/garden segment increased in production nearly 27% from 1996 to 1998. Furthermore, additional economic opportunities may emerge from future "beautification projects/efforts" spawned primarily by local or state governments. Many of these now involve massive plantings of greenhouse-produced bedding plants (e.g., pansy, petunia). Top states for total bedding plant/garden production include California (12% of total), Michigan (9.5%), Texas (6.9%), Ohio (6.7%), and Florida (5.6%).

Thus, if these trends continue, there appears to be many economic opportunities in the future for greenhouse production of bedding plants. This especially appears to be the case with bedding plants initially produced in pots in greenhouses. And, these opportunities can be realized by a variety of different-sized producers, from large national corporations to rather small operations, many in rural regions.

ALTERNATIVE CROP RESEARCH

Ms. Kaptur: Last year we provided some funding for alternative crop development with an emphasis on cocoa and coffee, with a recognition of the opportunity to do work regarding the control of domestic and tropical fungal and pest diseases. What have you requested for this effort in fiscal year 2001, and how is the work going?

Response: In fiscal year 2000, Congress appropriated $800,000 to initiate this work. The research, to date, has progressed very well; coffee is the largest export crop for tropical countries worldwide, while cocoa is the third largest traded tropical commodity. We are in the process of hiring a geneticist at our Miami facility and have developed a collaborative relationship with the Colombian Coffee Producers Federation to develop parasatoids for the control of coffee diseases. Active cocoa field trials, oriented towards improving disease resistance and product quality, are currently underway in Brazil, Peru, Colombia and Costa Rica, some funded jointly with the U.S. Department of State. We have also established a formal working relationship with the U.S. chocolate industry. We have not requested additional funding in fiscal year 2001.

Ms. Kaptur: What do you believe to be the benefits to our domestic agricultural industry from this research work?

Response: The U.S. chocolate and related confectionary industry accounts for over $24 billion in sales annually. Additionally, the industry is a major purchaser of domestic dairy products, peanuts, other tree nuts and sweeteners including corn syrup and cane sugar. The peanut industry benefits directly through aflatoxin research funded by industry and the federal government. Additionally, Phytophtora, a major disease problem, especially for the potato industry, will be a primary focus of the cocoa research in fiscal year 2001.

Integrated pest management strategies for Phytopthora can be applied directly the potato problem and related disease management issues.

WHEAT SCAB

Ms. Kaptur: Again from conversations I have had with Congresswoman Stabenow, can you update us on the wheat scab research initiative, the progress of the consortium, the level of funding proposed for fiscal 2000, and how your request matches with the needs assessment of the researchers in the field?

Response: The U.S. Wheat and Barley Scab Initiative (USWBSI) was funded at $3.5 million in fiscal year 1999 and increased to $5.3 million for fiscal year 2000. The funding level is near the level needed as identified by the USWBSI in 1998. The USWBSI is a consortium of federal, state, and private researchers, growers, and others concerned about the losses caused by scab in wheat and barley. The objectives of the Initiative are to seek funds to support scab-related research and education and to facilitate a coordinated scab research program within the United States.

The research initiative focuses on six distinct program areas: Variety development and coordinated screening nurseries; Epidemiology (how scab develops, spreads) and disease management; Food safety, toxicology, and utilization; Biotechnology; Chemical and biological control, and Germplasm introduction and evaluation. Researchers from 23 States and 7 locations within ARS are involved.

Research progress is already evident. Promising new sources of host plant resistance genes have been discovered, along with substantial progress in molecular tagging of previously discovered genes. Plant breeders are eliminating highly susceptible varieties and improving scab tolerances in new varieties. Genetic engineering advancements in scab research have been made, bio-control agents show promise, and studies confirm the efficacy of foliar fungicide treatments.

Some highly innovative methods are being employed in the scab research effort, including a fluorescent gene from jellyfish to help trace development of the fungus in infected plant tissues. Small radio-controlled aircraft are even used in one research project to document aerial spore movement.

Progress has also been made in unraveling the mysteries of the scab pathogen, including new knowledge on deoxynivalenol or DON, a byproduct of scab that can make barley unacceptable for malting and brewing, and wheat unacceptable for milling. Food processors throughout the U.S. can incur losses from the cost of dealing with grain infected by scab and DON.

GENETICALLY MODIFIED FOODS

Ms. Kaptur. It is very interesting to me that your testimony, Mr. Secretary, and that of both Dr. Horn and Dr. Laughlin touch only lightly on the issue of genetically modified foods. If you tell farmers that they need to position themselves for dealing in a world market, with the attention that bioengineered foods have received, can you tell us more thoroughly what you are doing to assess the safety of these foods, to develop effective and inexpensive testing for the determination of these foods, and to educate the American consumer about the risks and benefits of these items?

Response. Because these are high priority issues for the USDA and CSREES, a number of approaches are being taken to ensure a safe and sustainable food supply. These include research, education, and extension activities supported through competitive grants programs, and efforts to seek stakeholder input and discussion through advisory committees. For example, research, education, and extension activities supported under the Initiative for Future Agriculture and Food Systems will directly address issues of public concern about agricultural biotechnology, including bioengineered foods. Supported research will examine effects of agricultural biotechnology on human, animal, and plant health, as well as social and economic impacts. Although proposals have not yet been received, we expect the eventual outcome of funded activities to be better public understanding of the benefits and risks associated with this technology.

Since 1992 CSREES has funded research to assess the effects of introducing genetically-modified organisms into the environment through its Biotechnology Risk Assessment Research Grants Program. Over the years, this program has supported 73 studies for a total of $12.1 million, contributing information essential for science-based regulatory policy development. In fiscal year 1999, the following projects were funded under the Biotechnology Risk Assessment Research Grants Program:

Assessing Risk of Bollworm Adaptation to Bt Crops by Stable Isotope Analysis - North Carolina State University

Effects of Transgenic Resistance to Insects on Wild Sunflower Populations - Ohio State University

Field Testing a Hypervirulent Entomopathogenic Fungus - University of Maryland

Corn Rootworms, Resistant Transgenic Corn, and Weedy Grasses: A Recipe for Resistance Evolution? - University of Minnesota

Incidence and Origin of New Viruses in Multiple Virus-Resistant Cucurbits - University of California, Davis

Potential for Imidazolinone-Resistant Sunflower Gene Escape and Altered Fitness of Related Wild Species - Kansas State University

Gene Flow fromm Transgenic Cucurbita Pepo into "Free-living" Populations - USDA-Agricultural Research Service

In addition, the National Research Initiative Competitive Grants Program--NRI --supports research that contributes to more effective implementation of biotechnology in agriculture.

To ensure awareness of relevant issues and responsiveness to stakeholders, USDA sponsors advisory committees and other activities designed to address public concerns regarding agricultural biotechnology. The recently formed Advisory Committee on Agricultural Biotechnology--ACAB--will advise the Secretary on a broad array of issues related to this area. ACAB's first meeting will take place later this month. The Research, Education, and Economics Advisory Committee has also taken an interest in agricultural biotechnology, of late, and has focused its attention on related research issues. An internal USDA committee, the Biotechnology Coordinating Committee, with members from all relevant USDA agencies, also advises and provides support to the Secretary on biotechnology. We expect to benefit from the combined efforts of these committees in developing a comprehensive plan for the prudent use of biotechnology in agriculture. Finally, two recently funded activities will aid in communicating the benefits and risks of this technology to the public. First, the University of Florida has received an award to perform a review of the scientific literature relevant to biotechnology risk assessment and report on its findings in a nontechnical document accessible to all interested citizens. Second, the agency will provide partial support for a symposium entitled "The Engaged Institution's Role in Biotechnology Education" to be held at Iowa State University. The focus will be on providing educators with the knowledge and resources needed to communicate effectively about biotechnology science, products, and issues.

Ms. Kaptur. When you talk about collaborative international work on research, what are you doing on an international basis on the issue of genetically modified foods, with whom are you doing it, and what are both your goals and accomplishments to date?

Response. A good long-term example of international collaboration on biotechnology research is that of the United States-European Commission--EC--Task Force on Biotechnology Research, a group that falls under the National Science and Technology Council's--NSTC--Committee on Fundamental Science. U.S. Task Force members belong to the USDA and a number of other Federal agencies with an interest in biotechnology research--e.g., the Department of Defense, the Department of Energy, the U.S. Environmental Protection Agency, the National Institutes of Health, and the National Science Foundation. EC Task Force members are primarily from Directorate General XII, representing life sciences and technology. This task force has been active for nearly ten years in supporting joint activities in emerging areas of biotechnology research and encouraging collaboration and scientific exchange between U.S. and EC scientists. Over the years, the Task Force has sponsored more than a dozen workshops and other activities promoting international collaboration on cutting-edge topics in biotechnology. Within the last year, USDA Task Force members have sponsored workshops on genomics of farm animals and plant and animal bioinformatics. Both U.S. and EC scientists present research at these workshops, many of which result in subsequent trans-Atlantic collaborative research programs, student exchanges, and related activities. In addition, Task Force members regularly share information with each other on hot topics like biosafety, public perception of biotechnology, and ethical issues in biotechnology--a valuable mechanism for remaining up to date on issues of

interest to public officials on both sides of the Atlantic. To celebrate its tenth anniversary this year, the Task Force will produce a booklet describing its many accomplishments and contributions to US-EC cooperation. Another way in which USDA will sponsor international collaborations in agricultural biotechnology research is through the new U.S.-EU Science and Technology Agreement, which seeks to foster scientific and technological cooperation between the EC and the government of the U. S. At this time, USDA and other Federal research agencies are discussing the practicalities of fostering joint research and exploring mechanisms for supporting collaborative research under the Science and Technology Agreement.

Ms. Kaptur. I know that the jurisdiction for this issue is spread across several agencies of the Department, as well as with the Food and Drug Administration. Can you tell us the role that research and extension have, with whom you are working, and how you coordinate your agendas for research, testing, and education of both producers and consumers?

Response. The agencies of USDA coordinate their roles and responsibilities regarding agricultural biotechnology through an internal Biotechnology Coordinating Committee--BCC. BCC members come from all USDA agencies with biotechnology interests, provide advice and support to the Secretary on biotechnology issues, and work to coordinate agency activities. Coordination with agencies other than those of USDA often takes place on a program level, through contact with counterparts in other agencies. For example, during development of the program solicitation each year for the Biotechnology Risk Assessment Research Grants Program, counterparts from USDA's Animal and Plant Health Inspection Service, the U.S. Environmental Protection Agency, and the Food and Drug Administration--FDA--provide input about the kinds of information they need most for making science-based decisions in the regulatory process. That information is then used to develop research priority areas for the program solicitation. Also, to avoid duplication of effort, USDA directors coordinate their program solicitations with those of counterparts at other Federal funding agencies. Other coordinating mechanisms include inter-agency committees, such as the ones for food safety, in which members from relevant agencies, such as USDA, FDA, and the National Institutes of Health, meet regularly to discuss emerging issues and work together to address them. In addition, the new ACAB will consider a broad range of issues related to agricultural biotechnology and provide advice to USDA regarding research, testing, education, and other topics. Finally, two recently funded activities will aid in educating producers, consumers, educators, and the general public about the products of agricultural biotechnology and the risks and benefits associated with their use. First, the University of Florida has received an award to perform a review of the scientific literature relevant to biotechnology risk assessment and report on its findings in a nontechnical document accessible to all interested citizens. Second, the agency will provide partial support for a symposium entitled "The Engaged Institution's Role in Biotechnology Education" to be held at Iowa State University. The focus will be on providing educators with the knowledge and resources needed to communicate effectively about biotechnology science, products, and issues.

INTERNATIONAL PROGRAMS

Ms. Kaptur. You talk about launching a competitive grants program to provide funds to bring a more international involvement to agricultural programs, including research and teaching. Would you elaborate on this, please? How much can you do with only $1.5 million? Are other countries going to provide similar resources?

Response. CSREES is requesting $1.0 million for International Science and Education--ISE--a competitive grants program that is designed to support campus-based international activities in research, teaching, and/or extension. Planned in close consultation with colleagues from many land-grant campuses, the program's goal is to enhance the process of internationalizing American agricultural higher education in the classroom, at the laboratory bench, and through outreach efforts, in the farmers' fields. The program will contribute to the overall aim of maintaining our country's competitive edge in agriculture by helping to ensure that current and future generations of trained agriculturalists are globally savvy and can operate effectively in an increasingly inter-connected world.

With the modest level of funding requested, the program will be very strategically targeted so as to support a few key efforts that will serve as influential models from which others can learn and build. As the only such agricultural program in existence, we expect that the program will be carefully watched by administrators, faculty, and staff and that such interest by the higher education community will help us leverage the results from this innovative program.

We anticipate that other countries, as they are able, will provide both in-kind and direct financial support to activities under the program. As envisioned, the ISE will help to build important partnerships between American campus agriculturalists with counterparts overseas. Typically, those partnerships entail a substantial commitment on the part of the overseas colleague and his/her institution.

Ms. Kaptur. Exactly how do you plan to development international involvement? Will this be done by U.S. university or research applicants pairing with international institutions or other researchers? Or will you entertain research applications from non-U.S. sources?

Response. The ISE competitive grants program ISE will help to foster important international partnerships that help to internationalize agricultural programs in teaching, research, and extension at U.S. colleges and universities. U.S. higher education institutions will develop those partnerships that will most likely lead to co-planned and co-implemented activities. Proposals will only be accepted from U.S. institutions of higher education, and all funding will be made available to the U.S. institution as the lead institution. Applications will not be accepted from non-U.S. sources.

Ms. Kaptur. While I am sure that there are many good scientists and researchers, is there a danger that smaller institutions or lesser-known investigators may not be in a similar position to take advantage of the program?

Response. CSREES is committed to ensuring that support from the ISE competitive grants program is made available to a full diversity of institutions and individuals at those institutions. During the planning process, we involved several representatives from the American Association of State Colleges and Universities--AASCU--, an association which includes many smaller institutions in its membership. We also engaged the 1890 community in the design of the program. We are in the process of working with 1994 Tribal institutions to ensure that they are aware of the program. We plan to advertise the program widely though our list-serves which reach the full diversity of institutions--large and small. We will also discuss ISE at higher educational associational meetings and are planning to hold field-based grantsmanship workshops to ensure that all interested parties have a fair shake at competing in the program. Our selection panels will reflect the full range of eligible institutions.

Ms. Kaptur. There are already a number of joint research agreements between many of our Land Grant institutions and other non-U.S. universities. What will you do to make sure that the program fosters new relationships instead of refinances old ones?

Response. While it will be important that the ISE competitive grants program acknowledges the rich international research expertise that has been built over the years through joint agreements, CSREES is committed to ensuring that the ISE will model a different approach. Instead of supporting research activities only, the ISE will support new and innovative projects that are focused on integrating international research, teaching, and/or extension activities. This integration sets ISE apart from previous agreements and compels those submitting proposals to think anew. We anticipate that because of the stake that all campus-based agricultural programs have in teaching, research, and extension, many institutions which have not competed for support under existing agreements will be enticed to compete in the ISE program as either primes or collaborators.

Ms. Kaptur. How does this program assist in your training and development of new scientists?

Response. The ISE competitive grants program will assist in training and development of new scientists in both direct and indirect ways. It will provide direct support to those new scientists who are judged by peers as having submitted a winning proposal in international teaching, research, or extension. With the program's emphasis on new and strategic activities, the door will be open for new scientists to compete as they submit their best ideas. Just as importantly, the ISE program will strengthen the international content of teaching programs, and in so doing, will provide less direct but equally important global training and development to students who are the next generation of scientists.

Ms. Kaptur. Please give an example of the kind of activity that might be funded through the ISE program?

Response. The ISE competitive grants program might support a professor of Agricultural Economics at Tuskegee University in the lead, working in collaboration with a Food Science faculty member at Auburn University as they have students study the economic, social, and scientific hurdles to food

trade with Honduras. The project might involve offering student practicums in U.S. agricultural firms that market to Honduras, collaborating with Honduran researchers on food safety protocols that impact trade, and/or co-conducting extension training for small holder farmers in Alabama and Honduras in development of marketing cooperatives. Through these activities the project would serve the goals of the ISE program, namely to enhance international agricultural awareness, experience, and know-how on American campuses.

Ms. Kaptur. Why is the ISE program not funded by USAID?

Response. The U. S. Agency for International Development--USAID--has as its mandate the promotion of sustainable development around the world. All USAID-sponsored programs are focused on improving the economic, social, political and cultural prospects for people overseas. In contrast, the ISE competitive grants program is not designed to foster development abroad, but rather, to strengthen the international dimensions of food and food system programs at U.S. universities and colleges. This distinction is important and explains why USAID, while fully aware and supportive of the concept of the ISE, is not its sponsor.

Ms. Kaptur. How does the ISE program compliment programs funded by USDA's Foreign Agricultural Service.

Response. USDA's Foreign Agricultural Service ensures that U.S. agricultural goods find a ready market overseas. To do its work, FAS relies on a cadre of staff, advisors, and consultants who are versed in international agricultural markets. Increasingly, those markets are complex and nuanced. USDA/CSREES' International Science and Education competitive grants program (ISE) will compliment FAS's function by promoting the education and experience base of globally competent and competitive students and faculty. The ISE will help to ensure that the FAS is able to depend on campuses for well-trained graduates and faculty consultants as it continues its critical role in developing agricultural markets overseas.

Ms. Kaptur. I know that several countries have an interest in trying to create a system like our Extension Service to assist their own producers. I have heard of such interest in Ukraine and Russia. Are you aware of these efforts? Are you in any position to assist these groups in setting up such a system, or would you need additional resources to do it?

Response. CSREES is not aware of such a proposal, and therefore is not able to comment on what resources would be needed to assist in setting such a system up.

NUTRITION RESEARCH

Ms. Kaptur. Just as I asked Undersecretary Watkins, can you tell me if there is a real need for physicians to be educated in breastfeeding techniques? This is such an important issue for the WIC and CSFP programs, as well as for mothers and newborns generally. Education increases the likely incidence of breastfeeding. Do you currently have planned or would you support any studies or other efforts that would evaluate, design, and promote such an education program for physicians?

Response. We agree that physicians need training on the benefits, technique, and practices of breastfeeding. The American Academy of Pediatrics states that breastfeeding is the optimal form of nutrition for infants. Recent research has found significant new benefits of breastfeeding for both the infants and their mothers. Few medical schools provide training on breastfeeding and those that do often provide education of limited scope.

The Healthy People 2010 Health Objectives for the Nation calls for an increase to at least 75 percent of mothers breastfeeding at the time they leave the hospital following the birth of their child. In order for that significant health choice to be made, physicians must use their influence as the major health care providers. They cannot do this effectively without adequate training and experience. The combination of physician's influence and the breastfeeding education and support for mothers through CSREES programs, the WIC program, and other educational efforts, can make a difference. It will take all of these entities working together for society to reap the health care benefits and dollar savings breastfeeding can produce.

There are a number of efforts in that direction currently. The Nutrition Education Initiative that provided funding from fiscal years 1993 to 1996 enabled Cooperative Extension to work with WIC to provide intensive nutrition education to the neediest WIC clients. Several of these projects focused on breastfeeding promotion and support. Through continuation of these projects with other sources of funds, and the expansion of successful models to other states, Cooperative Extension has found that your premise of the physician role is well-founded.

The following are examples of Cooperative Extension Service--CES--programs to train physicians and health professionals on breastfeeding practices:

In the **North Carolina** In-Home Breastfeeding Support Program, they often do training targeting physicians, their staffs and nursing staffs from hospitals. Ideally, this type of training coincides with the implementation of the program in a county, and when possible, the training is offered in conjunction with physicians' rounds at the hospital. They find that attendance is improved this way.

In Shawnee County, **Kansas**, the EFNEP agent helped form an area Breastfeeding Coalition, which serves as a resource for health care professionals and social service providers working with families. Organizational members of the Coalition include the Expanded Food and Nutrition Education Program, LaLeche League, county health agency, and two local medical centers.

In **Michigan**, through cooperation between WIC and CES, a physician trainer is doing grand round presentations at several hospitals. A work group within the Michigan Breastfeeding Network is dedicated to addressing physician training. The chairs are two physicians who report that physicians insist upon being trained only by other physicians, preferably in their own speciality.

The Cooperative Extension Maternal and Child Health Specialist in **Nevada** has been working closely with both the Pediatric and Family Practice residents at the University Medical School. This includes presenting facilitative discussions to each group of residents annually. The Specialist is also the

President-elect of the Breastfeeding Task Force of Southern Nevada, which is planning a conference for physicians and nurses, including a session on the most current research pertaining the relationships of breastfeeding to intelligence and to obesity. In addition, Cooperative Extension fact sheets along with copies of research articles and other information is distributed to all pediatric offices in the immediate Las Vegas community during World Breastfeeding Week. CES in Nevada finds physicians to be an important audience in order to provide professional support to families who are considering or currently breastfeeding their infants.
As part of the Nutrition Education Initiative, **Rhode Island** developed an eight page brochure, "Breast is Best: A Physician's Guide to Common Breastfeeding Concerns." It was distributed to all Obstetricians, Gynecologists and Pediatricians in Rhode Island.

Guam coordinated the Western Pacific Regional Breastfeeding Conference as part of the Nutrition Education Initiative project in 1995; provides information for a periodic breastfeeding information letter edited by a community collaboration convened by Cooperative Extension; provides periodic in-service training at the local hospital and as part of the nursing conferences; and offered a 45-hour course on breastfeeding and human lactation for Continuing Education Units or undergraduate credit in summer 1999. This course provided the contact hours needed for professionals who met all other criteria to sit for the lactation consultants exam.

California Cooperative Extension established a partnership with the Vietnamese Physicians Association in Northern California as part of a project to support breastfeeding in Vietnamese women. In cooperation with the Physicians Association, they organized a Continuing Medical Education seminar focusing on motivating physicians to promote breastfeeding to their patients. All Obstetricians, Gynecologists, Pediatricians, and Family Practice physicians listed as members of the Vietnamese Physicians Association, were invited to attend. The conference featured presentations on the advantages of breastfeeding and research on breastfeeding behaviors and rate among Southeast Asians--particularly for the Vietnamese population in California--, factors inhibiting breastfeeding, and how to implement the American Academy of Pediatrics statement on breastfeeding in private physicians' offices.

As you can see, we do feel that physician education is a very important component of programs that are successful in increasing the numbers of women who breastfeed. We would welcome future opportunities to expand our efforts in this area.

NUTRITION RESEARCH

Ms. Kaptur. So much of the nutrition research that is done talks about the science of nutrition, but does not easily transfer to day-to-day practicalities of nutrition. What are you doing to make sure that the results of this research work is in a form that is likely to be understood, believed, and sought out by busy consumers?

Response. It is true that the results of the expanding knowledge acquired through research on the relationship between diet and health are not easily translated into "consumer-friendly" information. However, there is behavioral research that is geared to understanding the determinants and barriers to making healthy food choices that are useful in developing

community-based nutrition education programs for consumers throughout the life span.

Scientists at the ARS Human Nutrition Research Centers are increasingly aware of the importance of communicating science-based information to consumers and professionals. ARS human nutrition scientists work with the ARS Information Staff and representatives from the media to provide science based nutrition information to the public. The USDA's Dietary Guidance Working Group was formed to assist agencies in their responsibility to meet the objective of legislation related to dietary guidance and USDA's Food and Nutrition Policy and consists of eight USDA Agencies and a liaison member from the Department of Health and Human Services. The Dietary Guidance Working Group reviews dietary guidance materials produced by USDA and/or HHS for publication, distribution, or endorsement. The goal of the Working Group is to help fulfill USDA's responsibility to provide dietary guidance to assist Americans in selecting diets to improve their health and well-being. Recently a Human Nutrition Research Center Forum on Dissemination of Nutrition Information was held at USDA, ARS' Children's Nutrition Research Center at Baylor College of Medicine, Houston, Texas. This Forum brought together representatives from the 6 ARS Human Nutrition Research Centers and a representative from the ARS Lower Mississippi Delta Nutrition Intervention Research Initiative to discuss and share ideas as to techniques, resources, and types of nutrition information disseminated from each center, identification of the types of audiences that use our research, and to identify effective future strategies for disseminating nutrition information.

The Dietary Guidelines for Americans are science-based nutrition recommendations that provide the consumer with advice for healthy Americans, ages two years and over about making food choices that promote health and prevent disease. The consumer bulletin, *Nutrition and Your Health: Dietary Guidelines for Americans* is actively promoted by CSREES, in partnership with the Cooperative Extension System--CES. Nutrition professionals within CES, use the Dietary Guidelines as a basis for developing community-based nutrition education programs geared to a diverse audience of consumers. For example, Louisiana State Cooperative Extension Service reached 800,000 adults and youth with a consistent message to achieve better health by following the recommendations of the Dietary Guidelines. Additionally, nutrition professionals provided in-service training for teachers, school food service, nurses, and child care providers in 64 parishes.

Development of consumer-friendly nutrition literature and in-service training is not the only strategy being used to reach the consumer. The University of Kentucky, for example, recently developed a program that is based on the Dietary Guidelines, the Food Guide Pyramid, and the Recommended Dietary Allowances. This program was designed specially for chefs and cooks to help them adapt their recipes and their own personal nutrition and health lifestyle to achieve a more healthful diet . Each chef agreed to extend this nutrition education training to their respective kitchen staff, totaling approximately 500 kitchen personnel. This "train-the-trainer" approach has the potential to affect an unlimited number of consumers who will have the opportunity to eat healthier food because of the changes that chefs and cooks have made in their recipes and food preparation.

4-H ACTIVITIES

Ms. Kaptur. Dr. Laughlin, I know that 4-H work is funded within the formula funds for the Extension Service, but I am surprised that you have not taken some time to describe what is happening in 4-H. Given that we have a need for strong programs for our young people, shouldn't we be doing more to celebrate this program?

Response. There is certainly much to celebrate about the 4-H program, which is now beginning to prepare for its Centennial in the year 2002. In its first century, 4-H has enriched the lives of some 46 million Americans. It has expanded from a small program just for farm boys and girls to one of the largest youth development programs in the world, with 6.5 million U.S. youth involved every year and 4-H-type programs in 82 countries. Today, 11 percent of U.S. 4-H'ers in farms; 33 percent in rural non-farm and towns under 10,000; 23 percent in towns from 10,000-50,000; 9 percent in suburbs of cities; and 25 percent in inner cities. Twenty-eight percent of today's U.S. 4-H'ers are members of racial and ethnic minorities. The time, car mileage, and out-of-pocket contributions of the more than 650,000 volunteers who lead the program is estimated to be worth $1.9 billion per year.

Raising animals and growing plants continues to be of interest to millions of 4-H boys and girls. Today, the animal is just as likely to be a household pet as a beef steer, and the plants are more likely to be flowers than cornfields. The biological sciences the young people learn from the hands-on, learning-by-doing 4-H experiences continue to be important to their futures. Today's 4-H'ers are involved in Aerospace, in computer technology, in learning about healthy lifestyles, leadership, community service learning, workforce preparation, and hundreds of other exciting projects. 4-H is now using electronic connectivity to involve thousands of its youth and adult stakeholders in gathering the data, the research, and the emerging needs which will shape a new Strategic Plan to take the 4-H organization into its second Century.

Ms. Kaptur. In my own area, I have been troubled by the amount of waste that I see in our schools. There is a large amount of plate waste in the school food programs, which I have raised with Undersecretary Watkins. But in addition to that, virtually every school administrator will tell you that over the course of the year they gather an incredible amount of discarded clothes, shoes, school supplies, books, and other items. To your knowledge, are there any 4-H programs that are trying to take advantage of this material bounty through efforts to provide the items to other needy individuals, either nearby or internationally? I believe we could provide great benefits to those in need by recovering and sending off these discarded items, and in the process help our young people realize exactly how much may be going to waste that is still in perfectly usable condition.

Response. We have seen wonderful reports of community service efforts of all kinds by 4-H'ers. For example, one young 4-H girl came up with the idea of collecting used suitcases to be given to young people in foster care. In five years she has personally collected 17,000 suitcases, and organized groups of young people in all 50 states as well as Canada and Great Britain to carry out the same project. There are many other worthwhile examples of 4-H community service, but I have not heard of 4-H recycling school lost and found

materials. It's a very good idea, which we can pass along to the 4-H'ers on their website.

BLACK AND HISPANIC COLLEGES

Ms. Kaptur. I am encouraged by your efforts to expand partnerships through the 1890 and 1994 land-grant institutions, and the Hispanic-Service Institutions. I know that in speaking with several members of both the Black and Hispanic Caucuses, they have concerns about whether or not these institutions are getting a fair chance. First, can you describe in detail for us the recommendations made by the USDA Civil Rights Implementation Team, what you have done to implement them, and what remains to be done?

Response. The February 1997 Report by the USDA Civil Rights Action Team found that funding for the 1890 and 1994 land-grant institutions has not been adequate, which has contributed to the problems facing minority farmers. Specifically, the Civil Rights Action Team recommended that USDA should thoroughly examine funding of institutions of higher education to determine if 1890 and 1994 land-grant institutions are receiving equitable support to assist USDA in carrying out its mission. The Department should adjust its budget recommendations and consider other statutory or regulatory changes required to eliminate any disparate funding of land-grant institutions.

The Department has responded, both in budget and legislative recommendations. As part of the Administration's reauthorization of the research and education title of the 1996 Farm Bill, legislative amendments were incorporated into title 8 that increase resources available to the 1890 institutions through non-Federal matching requirements for formula funds, including Evans-Allen research and 1890 Extension funds, with the match phased in over a 4-year period. A second amendment extended eligibility to the 1890 and 1994 institutions to participate in noncompetitive 3(d) programs. It also extends eligibility to all accredited colleges and universities, including Hispanic-Serving institutions, to apply for competitive 3(d) programs. Other amendments benefitted the 1994 land-grant institutions by increasing funding for their extension programs and by authorizing appropriations for research at these institutions.

The President's fiscal year 2001 budget proposal includes several increases for minority-serving institutions. Funding for research grants at the 1994 land-grant institutions doubles from $.5 million to $1 million, the Tribal Colleges Endowment Fund increases from $4.6 million to $7.1 million, and Extension Services at the 1994 institutions grows from $3.060 million to $3.5 million while the Extension Indian Reservations Program increases from $1.714 million to $5 million. Funding for the 1890 Institution Capacity Building Grants Program increases from $9.2 to $9.5 million and the Hispanic-Serving Institutions Education Grants Program sees an increase of $650,000 from $2.85 million to $3.5 million, while the Multicultural Scholars Program doubles from $1 million to $2 million. These actions will strengthen USDA's ties and provide more equitable funding to the minority-serving institutions. USDA will continue to seek ways of strengthening the teaching, research, and extension capabilities of these institutions to better help USDA ensure a diverse and high quality scientific, technical, and professional work force for the food and fiber system.

Mr. Kaptur. Can you also explain and expand upon the recommendations to address disparities in funding and enhance the Department's cooperative efforts with institutions of higher education that are primarily devoted to the needs of minority students? In particular, how do you consult with these institutions to make sure your programs address their needs?

Response. The President's fiscal year 2001 budget proposal includes funding increases for 1890 and 1994 land-grant institutions as well as for Hispanic-Serving institutions as outlined in the response to the previous question. USDA has several mechanisms in place for aligning programs to address the needs of minority-serving institutions. Memorandums of Understanding have been signed by the Secretary with the Council of 1890 Presidents, the Hispanic Association of Colleges and Universities, and the American Indian Higher Education Consortium. These agreements established joint task forces and launched several initiatives of mutual interest with the minority-serving institutions. USDA liaison officers for the 1890 Institutions and the Hispanic-Serving Institutions also were established by these agreements. USDA is actively involved with the White House initiatives for Tribal Colleges, Historically Black Colleges and Universities, and Educational Excellence for Hispanic Americans. USDA staff conduct regional technical assistance workshops for minority-serving institutions and make site visits to campuses throughout the year. USDA staff also regularly attend the annual meetings of the associations representing minority-serving institutions and are often invited to make presentations at regional and national events. Faculty and staff from minority-serving institution often serve as panelists for our peer reviewed competitive grants programs and other initiatives. These formal and informal networks provide many opportunities for USDA to gain insight into the needs of these institutions, and they provide the means by which to take action on meeting those needs.

BLACK AND HISPANIC COLLEGES - NRI

Ms. Kaptur. Concentrating on the National Research Initiative, can you tell me how these institutions have fared in applying for and winning research grants? Please provide numbers for each of the past five years.

(The information follows.)

1890 LAND GRANT INSTITUTIONS

Fiscal Year	No. of Proposals Submitted	No. of Proposals Awarded	Success Rate
1999	22	3	13.6%
1998	26	2	7.7
1997	33	1	3.0
1996	27	4	14.8
1995	22	0	0

HISPANIC-SERVING INSTITUTIONS

Fiscal Year	No. of Proposals Submitted	No. of Proposals Awarded	Success Rate
1999	17	3	17.6%
1998	13	3	23.1
1997	32	5	15.6
1996	26	3	11.5
1995	26	2	7.6

Ms. Kaptur. To the extent that there may be a relatively small number of applications from these institutions for the NRI program, what are you doing to reach out to encourage them to apply?

Response. In previous years, the NRI conducted grantsmanship workshops at the National Conference of Historically Black Colleges and Universities and at Tuskegee University which were specifically tailored for the historically black colleges and universities. Starting with fiscal year 2000, the NRI has also made an effort to include scientists from the 1890 Land-Grant Institutions on each review panel to provide experience in the competitive review process which has been demonstrated to assist scientists in developing proposals. The NRI funds strengthening awards to small- and mid-sized degree-granting institutions that have previously had limited institutional success to increase the competitiveness of these institutions for NRI funds. All of the 1890 Land-Grant Institutions and most of the Hispanic-Serving Institutions meet eligibility requirements for these programs--there are other investigator-specific criteria which apply. These programs include Seed Grants, which are designed to provide funds to enable investigators to collect preliminary data in preparation for applying for a standard grant, Strengthening Standard Research Project Awards, which are additional funds set-aside specifically for strengthening-eligible proposals in the regular competition, Equipment Grants, which are designed to strengthen the research capacity of strengthening-eligible institutions, and sabbatical awards, to fund sabbaticals for individual faculty at strengthening-eligible institutions.

Ms. Kaptur. Have you ever done any kind of analysis to determine if the priorities used in the NRI match up with the priorities for these institutions?

Response. The NRI receives comments from stakeholders on its annual request for proposals--RFP--and has met with numerous stakeholder groups including the Association of Research Directors--of the 1890 Land-Grant Institutions. No formal analysis has been done to compare NRI priorities with those of a particular group of institutions, including Black and Hispanic-Serving colleges and universities. However, in that the NRI funds fundamental science in broad categories, including agricultural systems and economics, it is clear that many of the priorities of minority institutions would match well with NRI program areas.

Ms. Kaptur. When they have not been successful in competitive applications, what steps have been taken to review the applications with the institutions so that they may be better prepared for the process the next time?

Response. As with all unsuccessful NRI applications, a summary of the panel discussion and recommendations and edited copies of the individual reviews are sent to the Principal Investigator. These are usually quite detailed in explaining what the panel and the individual reviewers found to be the strengths and the weaknesses of the proposal. In addition, if the proposal is viewed as containing at least some merit, the panel summary and reviews often contain some specific recommendations for how the proposal could be improved. Further, investigators are routinely encourage to call the NRI Program Directors if there are questions or concerns about the panel summary or the reviews, as well as prior to submitting any future proposal.

CLEAN WATER ACTION PLAN

Ms. Kaptur. You are looking for an increase of $3.2 million for the integrated research and extension water quality program. Can you tell me whether or not any part of this program will concentrate on the problems of our largest fresh water supply -- the Great Lakes?

Response. The integrated research, education, and extension Water Quality Program is designed to protect water from contamination by agricultural chemicals--including agricultural plant nutrients and pesticides--and has also included efforts to reduce the overall impact of agricultural practices in degrading the physical structure and biological support capacities of water bodies. The program has never limited its scope to the identification or resolution of single problems or locales such as the Great Lakes. Instead, the program is structured to allow the stakeholder community, wherever it is located, to be the group responsible for the identification of most critical problems, and for the development of approaches to resolve those problems. This approach has historically resulted in the CSREES' support of a broad array of projects and state programs designed to reduce nutrient loading to targeted water bodies.

Ms. Kaptur. Do you have any kind of Great Lakes research and extension agenda? What would be the cost of such a program and how would it operate?

Response. In fiscal year 2000, CSREES restructured its Water Quality Program, placing all of the available funding under the Integrated Authority outlined in Sec. 406 of the Agricultural Research, Extension, and Education Reform Act of 1998. This authority will be used to further integrate the activities of research, education, and extension on a common basis. Watersheds will serve as the common activity and reporting unit to be used within a regional coordination structure that will facilitate inter-state collaboration as well as collaboration with other Federal water quality programs. The objectives of these watershed-based activities would be to identify the causes of water quality degradation; conduct research filling the gaps that are critical to the development of water improvement practices and programs; implement watershed-scale improvement programs; monitor the efficacy of the improvement programs implemented; assess the costs and benefits of water quality management; and conduct evaluations closing the loop and

improving our understanding of the drivers of water quality degradation.

For fiscal year 2001, CSREES has requested an additional $3.204 million to enhance current efforts by conducting integrated farm- and watershed-scale research, education, and extension on ways to reduce nutrient and pesticide delivery to streams and rivers draining into coastal ecosystems --including the Great Lakes. If funded, the CSREES Integrated Water Quality Program will promote a stronger linkage between research, education, and extension to ensure that education and outreach programs reflect the most current scientific knowledge resulting from the Research, Education, and Economics water quality research and development efforts. These additional funds will also be used to support interagency programs designed to assess and reduce nutrient delivery to impacted coastal areas.

The CSREES has not conducted a specific analysis of likely costs for the full implementation of a Great Lakes Extension Program. We believe the CSREES Integrated Water Quality Program can best serve the needs of the nation by supporting a continuing program of research, education, and extension that brings our country's best university scientists, educators, and extension specialists to the service of water quality improvement efforts that are specific to regional locales. To address this need, the CSREES Integrated Water Quality Program places the largest single allocation of its funding--currently $5 million per year--into Regional Water Quality Coordination grants that are designed to make research, education, and extension resources of the university system more accessible to Federal, State, and local water quality improvement efforts, thus enhancing opportunities for agricultural producers and agriculturally-impacted communities to adopt voluntary approaches for the improvement of water quality. Grantees are expected to facilitate the conceptualization and implementation of multi-partner efforts that minimize duplication of effort and that leverage multiple funding sources into a common collaborative effort. As such, it is expected that coordination grantees will initiate partnership activities with key water quality efforts in their region. The CSREES would expect that regional coordination grantees in areas having drainages to the Great Lakes to focus a substantial portion of their efforts on water quality issues and education, extension, and research efforts that are common to the Great Lakes.

AGRICULTURE IN THE CLASSROOM

Ms. Kaptur. I have received a lot of support for the Agriculture in the Classroom Program in recent days. Can you highlight for us some of the successes of this program?

Response. The Agriculture in the Classroom program has been an effective vehicle to provide students and educators with accurate information about food and agriculture. The program integrates scientifically-valid agricultural information into a variety of academic disciplines including science, the social sciences, language arts, and mathematics. The program reaches over 120,000 teachers annually, impacting over 5 million students.

We reach teachers through a variety of activities such as a national web site linking State programs and other related agricultural projects, national teacher awards honoring outstanding teachers incorporating agricultural concepts into their curriculum, annual conferences attended by over 300

teachers and educators, and a network of State programs coordinated by the National Agriculture in the Classroom Consortium. In addition, we seek to make agricultural concepts a part of national initiatives such as the Millennium Green.

Ohio's Agriculture in the Classroom program has been successful in developing a comprehensive educational kit in conjunction with Ohio State University. This kit meets the Ohio's Kindergarten through third grade competencies and helps prepare students for their State proficiency tests.

In 1999, eight graduate credit courses were offered throughout Missouri to better acquaint 200 teachers with agriculture and demonstrate how to integrate some facet of agriculture into the regular classroom curriculum. On average, each participating teacher will teach 10 years, reaching over 50,000 children. Efforts of this nature are being replicated across the Nation.

Ms. Kaptur. There has been some suggestion that we increase funding for this program by $500,000. What could be accomplished if such an increase was provided?

Response. Additional funding would allow the Department and the Agriculture in the Classroom community to expand education outreach activities to under-represented groups, support regional demonstration projects, continue the integration of information technology to lower program delivery costs, and increase the outstanding teacher recognition initiatives.

Other planned initiatives include the development of materials which portray scientifically-accurate and technologically-advanced operations of agriculture, dissemination of materials about career opportunities in the food and agriculture arena, research and evaluation of program components, an expanded network of educators involved in promoting agriculture, and strengthened relationships between the Agriculture in the Classroom community and our partnering college and university systems.

Capacity to address shifts in demographics, especially among Hispanic and Native American populations, is limited. Funding shortfalls contribute to the lack of a program evaluation and inhibit teacher curriculum development. Outreach activities have been scaled back, and popular, high demand resource materials such as the "Resource Guide," "Science In Your Shopping Cart," and "A History of American Agriculture, 1776-2000" have not been updated nor made available. Additional funds will strengthen these initiatives.

Ms. Kaptur. Can you provide for the record a table showing, by State, the number of schools, students, and the primary grade levels in each State for which Agriculture in the Classroom is available?

Response. States are gathering the data to present in their annual program summary, which is due in April. However, Agriculture in the Classroom is available to all public and private schools, and home schoolers in each State. The program is available to grade levels Pre-Kindergarten through community colleges in most States. The following table reflects the broad outreach of Agriculture in the Classroom 1999.

Agriculture in the Classroom Availability by Selected States

States/ District of Columbia	Number of Schools	Number of Students	Grade Levels
Alabama	1,154	37,000	Kindergarten - 12th Grade
Alaska	3 Districts	24,250	Kindergarten - 12th Grade
Arkansas	232		Kindergarten - 6th Grade
California	12,000	6.3 million	Kindergarten - 12th Grade
Colorado		50,000	4th - 7th Grade
Connecticut	795	375,000	Kindergarten - 8th Grade
Delaware	85	2,875	Kindergarten - 5th Grade
District of Columbia	11	728	4th - 6th Grade
Florida		41,000	Pre-Kindergarten - 12th Grade
Georgia	2,330	1,447,687	Kindergarten - 12th Grade
Illinois	1,320	288,450	Kindergarten - 12th Grade
Indiana	3,100	47,191	Kindergarten - 6th Grade
Iowa	250	100,000	Kindergarten - 12th Grade
Louisiana		13,000	Kindergarten - 12th Grade
Maryland	400	40,000	Pre-Kindergarten - 12th Grade
Massachusetts	2,500		Pre-Kindergarten - 12th Grade
Michigan	200	50,000	Kindergarten - 5th Grade
Minnesota	1,000	85,000	4th - 8th Grades

States/ District of Columbia	Number of Schools	Number of Students	Grade Levels
Mississippi		105,578	Kindergarten - 4th Grade
Missouri	3,500	37,500	Kindergarten - 6th Grade
Montana	906	172,072	Kindergarten - 12th Grade
Nebraska	209	9,465	Kindergarten - 12th Grade & Colleges
Nevada		19,500	Kindergarten - 12th Grade
New Jersey		100,000	Kindergarten - 5th Grade
New Mexico	62 Districts/3 Colleges	382,776	Kindergarten - 12th & Colleges/Univ.
New York	1,200	500,000	Kindergarten - 12th Grade
North Carolina	2,024	1,238,000	Kindergarten - 12th Grade
North Dakota		14,000	Kindergarten - 12th Grade
Oklahoma	1,130	28,908	Kindergarten - 6th Grade
Oregon	25	1,189	Kindergarten - 4th Grade
Rhode Island	12	200	Kindergarten - 6th Grade
South Carolina	1107	666,485	Kindergarten - 12th Grade
South Dakota	482	28,278	Kindergarten - 6th Grade
Tennessee	1,700	200,000	Kindergarten - 12th Grade
Texas	150	40,000	1st - 6th Grades
Utah	489	288,000	Kindergarten - 12th Grade

States/ District of Columbia	Number of Schools	Number of Students	Grade Levels
Vermont	394	118,205	Pre-Kindergarten - 12th Grade
Virginia	110	12,827	Kindergarten - 5th
Washington	280	4,500	Kindergarten - 12th Grade
West Virginia	40	3,000	4th Grade
Wisconsin	428 Districts	1,010,500	Kindergarten - 12th Grade
Wyoming	275	45,000	Pre-Kindergarten - 12th Grade

AGRICULTURE IN THE CLASSROOM

Ms. Kaptur. The National Council for Agricultural Education has also proposed that we provide $200,000 to help create Agricultural Centers of Excellence that will locate, design, and develop instructional materials about agriculture. Are you familiar with this proposal? What comments do you have about it?

Response. The National Council for Agricultural Education has shared some early ideas that are still very much in the developmental stage regarding the establishment of Centers of Excellence for preparing instructional materials about agriculture. Such Centers would be similar in nature to those supported by the U.S. Department of Education in the 1970's and 1980's. The Council has been exploring both private and public sector funding.

Typically, curriculum design and development are state and local responsibilities with the Federal partner serving primarily as a catalyst for changes.

HYDROPONICS

Mr. Kaptur. Can you describe for me what kind of hydroponics research you have underway, its location, and what your budget request is for this activity?

Response. The Cooperative State Research, Education, and Extension Service's state partners report through the Current Research Information System that there are 67 active projects involving hydroponics. These projects are at 35 Land Grant Universities. Research involves production systems using hydroponics for horticultural crop production. Other research topics address studies on animal waste and nutrient management, and studies on toxic metal accumulation by plants, plant diseases, and pesticide uptake and degradation. The states report approximately $1.0 million expended for fiscal

year 1998 from CSREES funds. CSREES's budget request is not specific for hydroponic research.

ARS conducts research on hydroponics in support of a program to develop sustainable, year-round culture regimes under protective environments that will not be reliant on methyl bromide and herbicides. This research program focuses on strawberry and other high-value plant commodities. Soilless culture systems are developed which optimize environmental conditions to enhance crop production and quality while reducing pest and disease problems. Optimal mineral nutrition strategies are developed to maximize yield and quality and minimize point source pollution and disease outbreaks.

The ARS research program is conducted at the Appalachian Fruit Research Station, Kearneysville, West Virginia. The proposed fiscal year 2001 funding for hydroponics research is estimated at $99,000.

CENTER FOR INNOVATIVE FOOD TECHNOLOGY

Ms. Kaptur. The Center for Innovative Food Technology has worked with food processors to deal with concerns about food safety. They had pursued funding from the Department for the development of the Midwest Safe Food Coalition. While my understanding is that Department personnel have substantiated that the proposed work is valued and needed, it seems that the criteria used in the National Research Initiative will not allow for consideration of this proposal. How familiar are you with this problem, and do you have any solution to it?

Response. The National Research Initiative--NRI--Competitive Grants Program supports high priority research in the biological, environmental, physical, and social sciences relevant to agriculture, food, and the environment. NRI places special emphasis on basic research in farming, ranching, forestry including urban and agroforestry, aquaculture, rural communities, human nutrition, and food processing. While the Center for Innovative Food Technology is a worthwhile effort, and has potential for making a positive contribution in the improvement of food safety, its mission is not linked to fundamental research, nor does the Center employ a research-based approach to solving problems in food safety. Thus, the Center proposal was not appropriate to the mission of the NRI Competitive Grants Program in food safety and other areas. One potential funding source for the Center might include the Initiative for Future Agriculture and Food Systems--described in Section 401 of the Agricultural Research, Extension, and Education Reform Act of 1998. This Initiative, if funded in fiscal year 2000, would provide competitive funds for programs that successfully integrate research, education, and extension and/or address the concerns of small and mid-sized producers and land managers, especially in natural resource management and farm efficiency and profitability. Federal research agencies would be eligible to apply for these funds if allocated by Congress this year.

Ms. Kaptur. It is my understanding that they are seeking $400,000 for the development and application of modern manufacturing technologies and techniques in the food processing industry to enhance food safety. Do you believe this proposal is worthy of consideration?

Response. In recent years, food safety research priorities in CSREES have been coordinated with the various agencies within USDA. A focus of the coordinated research has been the development of new and innovative technologies in food science and food safety, including methods for the detection and control of microbial pathogens and chemical contaminants in production, processing, and food handling environments. We believe that as new methods are developed, it is vital that this technology be transferred to governmental regulatory and action agencies, producers, processors, and other commercial and noncommercial food handlers.

AGRICULTURAL BUSINESS ENHANCEMENT CENTER

Ms. Kaptur. What has been your assessment of the operations of the Agricultural Business Enhancement Center in Ohio?

Response. The Agricultural Business Enhancement Center conducts economic research on market opportunities, provides a variety of management training programs, helps individual farms and other agribusinesses develop comprehensive business plans, and facilitates networking with businesses in other regions of the United States and around the world. The Center is very effective in enhancing incomes in Northwest Ohio.

Ms. Kaptur. In auditing the program, have you been able to determine other sources of support for the Center? In particular, have you been able to identify funds on a programmatic basis?

Response. Each year the project reports additional resources appropriated by the state of Ohio as follows: $35,100 in fiscal year 1991; $72,368 in 1992; $56,930 in 1993; $30,547 in 1994; $49,935 in 1995; $51,432 in 1996; $48,664 in 1997; $53,736 in 1998; and $56,186 in 1999.

Ms. Kaptur. Are there other Extension programs operated by or through the ABE Center, and if so, are other Extension resources supporting these programs?

Response. Yes, there are two state-wide programs operated through the Center. One program is the Extension Farm Labor Relations program and the other is a hydroponic greenhouse vegetable program. Northwestern Ohio agriculture is a major employer of seasonal migrant labor. Agricultural employers of seasonal migrant labor are the target audiences for the Extension Farm Labor program. $65,000 of state funds are allocated annually--fiscal years 1998, 1999 and 2000--for the operation of this program. The hydroponic greenhouse vegetable program is a USDA grant through the Ohio Agricultural Research and Development Center. The program is located at the ABE Center because of a major field vegetable crop and greenhouse industry in Northwestern Ohio. About $60,000 of the USDA grant money is spent on activities through the Center. The rest of the funds is spent on activities at OARDC.

Ms. Kaptur. Has there been any kind of evaluation of the programs of the Center by its users? If so, what are the findings?

Response. Yes, the following five programs have been evaluated:

The Toledo Farmers' Market - The Center was a partner in assisting the City of Toledo and local producers in changing the market from city operated to producer operated. The market has had tremendous success in improving producer income and in providing fresh produce to ever increasing crowds of customers. About 160 producers now participate in the market.

The Women in Agriculture Program - An annual Women in Agriculture conference has been conducted for five years. About 160 women have been attending the conference recently. Program evaluations indicate that the women intend to apply the business and personal information that they receive at the conference. The program expanded in 1999 to include targeted subject matter sessions at other times during the year. This was done at the request of the participants.

The Perrysburg Farmers Market - The Center assisted the city of Perrysburg and the local producers in conducting a farmers market in 1999. Fourteen producers participated in the market. Eight producers responding to a survey indicated that they were very satisfied with the market. Seven of the eight producers indicated that their revenues were either equal to or better than they had expected from the market. The market will operate again in 2000.

The Green Industry Summer Field Day - About 200 professional green industry personnel participated in the second annual field day. Written evaluations of the program indicate that the program is very beneficial in improving the skills and knowledge base of people working in the green industry.

Hydroponic Greenhouse Vegetable Workshop - About 50 people participated in the three-day workshop. Written evaluations indicated that the sessions were very helpful. The workshop was the first of its kind for an educational institution. A hydroponic greenhouse vegetable study committee resulted from this workshop and from a producer trip to visit hydroponic greenhouse production in Ontario.

Ms. Kaptur. To the extent that the purpose of the Center is to enhance economic viability in the region's food and agriculture industry, what could it do in your view to improve its operation?

Response. One suggestion is to strengthen the partnership between the Center and the economic development professionals in Northwestern Ohio. The second is to involve producers and others in the agricultural industry in exploring niche markets for value-added opportunities. Both suggestions are being pursued in 2000.

WHEAT SCAB

Ms. Kaptur. Again from conversations I have had with Congresswoman Stabenow, can you update us on the wheat scab research initiative, the progress of the consortium, the level of funding proposed for fiscal 2000, and how your request matches with the needs assessment of the researchers in the field?

Response. CSREES is not presently involved in research on wheat scab. There is an initiative on wheat scab that is managed by the Agricultural Research Service--ARS. ARS manages these funds, program and project selection, and resource distribution for the wheat scab consortium.

BOVINE TUBERCULOSIS

Ms. Kaptur. I have been working with Congresswoman Stabenow of Michigan regarding her very real concerns about bovine tuberculosis in deer in Michigan. We provided some modest research funds last year to help with this situation, but more is apparently needed. Can you tell me what additional resources you have that you might be able to devote to this project and what additional resources beyond that which you would need in order to do a complete job?

Response. At present the only funding resources which would have been available are funds in CSREES' National Research Initiative which provides funding through competitive review of submitted proposals. The deadline for submitting proposals has already passed for this funding year.

After consultation with research administrators at Michigan State University, we have determined that other research or investigative activities, which could contribute to solving the deer tuberculosis problem in Michigan, include the following:

Expanded epidemiology and surveillance studies on the prevalence of positive deer with risk analysis efforts leading to control and eradication efforts
Studies on food safety implications and economic risk assessment
Diagnostic method development and pathogenesis
Sociological and psychological studies related to public attitudes on the deer situation
Ecology of the deer population
Public information and communications to educate the public on the issues involved

A single annual award that would support expanded research efforts on these topics in a planned and well-designed research effort with sustained funding over a 3-5 year period would provide the greatest likelihood of solving this problem. Not all of these topics can be done simultaneously and some of them depend on results in earlier studies. Thus, sustained funding is more important than one or two very large awards. Additional annual funding in the amount of $500,000 to $700,000 would serve to expedite solutions for this problem, while higher funding levels would not continue to accelerate the rate of progress.

BEEF INDUSTRY IMPROVEMENTS

Ms. Kaptur. There are efforts to establish the Ohio Family Farm Beef Industry Group, the purpose of which would be to train a new generation of cattle feeders, developing relationships with cow-calf producers looking for opportunities to increase their profitability, and developing marketing channels for beef that is produced to meet the requirements of targeted

processors and consumer groups. This project has been developed in collaboration with Extension personnel in Ohio, and with Ohio State University Department of Animal Sciences. Are you familiar with this proposal, and can you tell me any more about it?

Response. The Ohio Family Farm Beef Industry Network is a proposed plan to stimulate the economic development of family farms in Ohio, with primary emphasis in several counties in the northwestern part of the state. The region has been under economic duress because of the decreased economic return from pork production in that region. Marketing grain through cattle appears to be an economically-viable option for this region of Ohio. The proposed plan is a joint effort by local cattle producers, county agents in that area and the Department of Animal Sciences at Ohio State University. This Network would form an alliance to produce feeder calves, finish them in feedlots, and process them through small packing plants in the region. The cattle producers would develop a quality meat product that meets the very highest food safety standards, and would be marketed as a branded beef product.

SATELLITE IMAGERY

Ms. Kaptur: Mr. Bosecker, you suggested that NASS has been using satellite imagery to improve agricultural statistics. Can you tell us how much of that is done by NASS itself, and how much in collaboration with NASA or other agencies?

Response: NASS conducts most of the effort itself in order to improve agricultural statistics utilizing remotely sensed data. Remote sensing data are utilized for the construction of improved area sampling frames and for improved crop acreage estimation in five selected States. However, NASS has recently expanded partnerships in this area with State government agencies in Illinois, Mississippi, and New Mexico. NASS has also been in a partnership with the Agricultural Research Service to evaluate new satellite sensors for crop monitoring purposes on a relatively small scale.

Ms. Kaptur: When you obtain the data, where does it go and how does anyone access it? Is there any kind of "master" remote sensing inventory?

Response: Since 1996, NASS has acquired most of the Landsat 5 imagery through a partnership with USDA's Foreign Agricultural Service (FAS) and Farm Service Agency (FSA) who procures it from a private vendor. The license with the vendor prohibits use of the raw data outside of USDA agencies. However, once the raw data are categorized into probable crop types by NASS, then that value-added data will be available to the public. FAS has an archive of procured satellite data. Under this proposal, the data would be distributed to agencies and the public as appropriate under licensing agreements. NASS has expressed its support for this centralized distribution.

Ms. Kaptur: NRCS has requested $5 million for work on geospatial data. Does this activity combine in any way with what you are doing, and how would you integrate the data?

Response: The $5 million request by NRCS is for a Community/Federal Information Partnership Initiative which would provide assistance to communities for various mapping projects. NASS is not directly involved in this program. However, if the project leads to greater coverage of the U.S. land area with digital ortho-photo quadrangle maps, then NASS will be a beneficiary, as NASS is beginning to use these maps in its area sampling frame construction and maintenance program.

Ms. Kaptur: You make the point that "the domestic agenda is a global agenda". As a small farmer, I have seen the company that processes my produce move to Mexico because trade agreements have made it attractive to do so. I know that production practices there are not as restrictive, that labor rates are barely a fraction of what they are for me here. I see my price from my buyers-the larger and larger conglomerates-holding steady at best, and more than likely going down, while at the same time the retail price in the grocery store just a few miles away from my farm is going up. It doesn't make sense to me, but it is happening every day. What can you say to encourage me to continue in agriculture as a small to medium sized producer, or has my time gone?

Response: Small and medium sized producers can prosper and remain in the business as long as they remain competitive. Research shows that small farms can be successful if they are low cost producers utilizing the resources on hand. In other words, effectively managing production. Second, identify the market for the product and use information effectively to produce and sell products. For example, small and medium sized farmers can supply to niche markets (organic produce, specialty restaurants, and other high value products). Third, alter your enterprise mix. Research shows that diversified small farms tend to face lower product or price risk, thereby operating at a larger profit margin and are more successful. Finally, expanding your operation can have a positive impact. Expansion can be achieved by either buying or leasing land. Leasing is more attractive for credit constrained farmers. Further, there are Federal programs that help low-equity producers to acquire more land if needed.

Evaluation of Rural Development

Ms. Kaptur: Ms. Offutt, within your goal of the agricultural production system is highly competitive in the global economy, how much have you worked on evaluating the impact of agriculture on local economies and rural development? Have you done studies of the impact of GATT and NAFTA on rural areas, particularly in the Midwest?

Response: The impact of agriculture on local economies and rural development is a continuing interest for ERS. We monitor and report on *Farming Dependent Counties* as one of six possible categories within ERS's non-metro county typology. Farming dependent counties account for 556 of 2,276 total non-metro counties. We regularly contrast conditions and trends in *Farming Dependent Counties* relative to other non-metro and metro counties in our monograph series ***Rural Conditions and Trends*** and ***Rural Development Perspectives***.

Rural American prosperity, while largely dependent upon domestic economic events, has always been vulnerable to international influences. As you know, the NAFTA Implementing Legislation of 1993 required a United States Department of Agriculture biennial report to the United States Congress starting in 1997 which evaluated the effects of NAFTA on agriculture and rural areas. We have submitted this report and conducted numerous other special NAFTA analyses distributed through agency publications, professional meetings and academic journals. An excellent example of this work is a paper authored by ERS researchers entitled *U.S. Agricultural Trade and Its Impact on the Midwest Rural Economy* (attached for the record).

U.S. Agricultural Trade and Its Impact on the Midwest Rural Economy

September 18, 1996
William Edmondson, Economist
RED, Economic Research Service

Gerald Schluter, Agricultural Economist
RED, Economic Research Service

Chinkook Lee, Agricultural Economist
RED, Economic Research Service

Lowell Dyson, Social Science Analyst
RED, Economic Research Service

This paper is one of a series associated with the September 18, 1996, workshop "Global Linkages to the Midwest Economy." Linda M. Aguilar, Jack L. Hervey, and Thomas H. Klier served as workshop conveners and editors. The workshop was the sixth of a series held at the Federal Reserve Bank of Chicago as part of the 1996–97 project "Assessing the Midwest Economy." Inquiries should be directed to the Public Information Center, Federal Reserve Bank of Chicago, P.O. Box 834, Chicago, Illinois 60690-0834, or telephone (312) 322-5111. The Federal Reserve Bank of Chicago's Web site can be accessed at http://www.frbchi.org.

I. Introduction

Rural American prosperity, while largely dependent upon domestic economic events, has always been vulnerable to international influences. This has been true since the beginning of the nation. Tobacco and cotton were important export commodities in the first century, followed in the second half of the nineteenth century by wheat and flour and other grain products. According to agricultural economist and historian, Willard Cochrane:

> "The absolute expansion in the exports of agricultural products, particularly in grains, between 1866 and 1900 contributed importantly to the development of American agriculture during that period." (Cochrane, pp. 268)

The rural economy remains closely tied to global economies, making it sensitive to changes in global competition. For example, agricultural trade, which was constrained by the protectionist policies pursued by many countries, is now moving toward both multilateral and regional free trade through the GATT agreements, establishment of the World Trade Organization (WTO), and regional pacts such as NAFTA. Recently, the weaker dollar and the U.S.'s support of multilateral trade liberalization, which worked to open other countries' agricultural markets, resulted in strong exports for U.S. products. For example, U.S. agricultural exports surged to a record $55.8 billion for calendar year 1995, $10.1 billion over the previous calendar year. With some year to year variation, this trend of agricultural trade growth will likely continue in the future and will have economic impacts in rural America.

The production of agricultural exports requires farmers to purchase fuel, fertilizer, and other necessary inputs. Agricultural exports also spur economic activity down the line in the manufacturing, trade, and transportation of these products. Conversely, agricultural imports could replace domestic production activity and could result in a loss of income and employment in rural areas.

The purpose of this paper is to estimate employment effects of U.S. agricultural trade in the Chicago Federal Reserve District and its rural economy. Using input–output (I/O) analysis, we measure the effect on the national economy, in terms of employment, of agricultural trade in calendar year 1995. We further refine the model, using *County Business Patterns* (CBP) data, to distribute these effects to states and to nonmetro or rural areas of the states and the nation.

II. Background

Many studies have analyzed trade effects of agriculture in the national arena. Edmondson, Petrulis, and Somwaru (1995) and Lee, Schluter, Edmondson, and Wills (1987) analyzed the economy-wide effects of the U.S. food and fiber system. Edmondson (1994) and Harrington, Schluter, and O'Brien (1986) examined the agricultural trade effects on the national economy. However, until recently (references 3 and 7), no specific studies have linked agricultural trade and rural employment. Many regional planners and rural development advocates have looked at the current boom in agricultural trade and seen an opportunity for further economic expansion. This analysis measures the contribution of 1995's agricultural trade to the economy of the five states in the Chicago Federal Reserve District (Illinois, Indiana, Iowa, Michigan, and Wisconsin).

III. Exports Have Gained In Importance to Rural Areas

In the 1990s, both the weaker dollar and the U.S.'s support of multilateral trade liberalization, which worked to open other countries' agricultural markets, have stimulated U.S. exports. In 1988, U.S. agricultural exports amounted to $35.3 billion. They grew to $42.4, $42.5, and $45.7 billion in calendar years 1992, 1993, and 1994, respectively, and then jumped $10.1 billion to a record $55.8 billion in 1995. The 1995 export value surged on higher shipments and prices of wheat, corn, and soybeans (about 57%, 31%, and 39%, respectively, of crop year 1995-96 production was exported) and increases in high-value products (HVP) shipments, primarily poultry meat, beef, fruits, and vegetables.

Previous studies by Lee and Schluter (1993 and 1995) suggest that in the 1970s and 1980s much of the demand growth supporting the increased output of grain and oilseeds came from exports. The leading agricultural commodities exported nationally—corn, wheat, and soybeans—use land and capital inputs extensively, resulting in direct and indirect demand for rural land and capital while also generating employment in rural areas (Lee, Wills, and Schluter, 1988, pp. 267). The Chicago Federal Reserve District accounted for about 40% of the corn, 50% of the soybeans and 5% of the wheat produced in 1995. In the 1990s, however, export value has increased not only in shipments of traditional bulk wheat, corn, and soybeans but also in HVP shipments, primarily poultry meat, beef, fruits, and vegetables. While the Chicago Federal Reserve District is not quite so heavily represented in the production of these particular products, it is well represented in producing processed foods and, of course, the grain and oilseed inputs into the processed foods, and so has shared in the growth of this category of exports. The commodity composition of agricultural exports is changing and if recent trends continue, most of the regional employment benefits related to agricultural exports will shift to areas that produce and process HVP.

What are some implications of expanded agricultural trade to the Chicago Federal Reserve District economy? Because the U.S.'s rural and general economy is extremely diverse, differences in various regions make broad generalizations difficult. The mix of farm and processed food products produced in the District, however, suggests that this District should be favorably affected by such an expansion.

IV. Methodology and Sources of Data

The method used here is an I/O analysis, similar to the methodology used to analyze income and employment generation in the food and fiber system (Edmondson, Petrulis, and Somwaru, 1995, and Lee, Schluter, Edmondson, and Wills, 1987). For this analysis, we use the 1987 U.S. I/O tables (USDC/BEA, 1994), the latest available. An I/O table provides an economy-wide environment in which to analyze the corresponding levels of sectoral output, income, and employment needed to meet differing levels of agricultural trade. Specifically, we examine the effect of 1995 agricultural trade on sectoral output, income, and employment. Our focus will be on estimating rural employment.

First, sectoral income for the base year (1987) is derived as:

$$\text{Income} = \sum_{j=1}^{n} V_j$$

where V_j is value added in sector j. In the U.S. I/O tables, n=524 sectors.

Sectoral output for the base year is derived as:

$$X = [I-A]^{-1} * f$$

where,

X = an n x 1 vector of sector outputs

$[I-A]^{-1}$ = an n x n I/O total requirements matrix, and

f = an n x 1 vector of agricultural exports or imports.

Under an I/O structure, value added is a fixed proportion of output, so that income can be written in a matrix form as:

1) $\text{Income} = v*X = v*[I-A]^{-1}*f$

where, v = an n x n diagonal matrix of value added per dollar of sector output coefficients.

Using the above notation, employment in each sector can be derived as:

2) $E = l*[I-A]^{-1}*f$

where, l = an n x n diagonal matrix of civilian employment coefficients per dollar of sector output.

E = an n x 1 vector of sector employment needs, e_j's, for meeting the total output required to satisfy agricultural exports or imports.

To estimate nonbase year (such as 1995) income, we have to incorporate price deflators for the income to make the "constant dollar" measure of agricultural trade to the base year (1987) prices. Thus equation (1) becomes:

3) $\text{Income} = v*[I-A]^{-1}*f'$

where, f' = 1995 agricultural exports or imports in 1987 prices.

Similarly, to estimate nonbase year (1995) employment, labor productivity changes in both the farm and nonfarm sectors have to be incorporated. Without this adjustment of productivity, elements e_j of vector E in equation (2) would either overestimate or underestimate the total employment in jth sector. Thus, equation (2) becomes:

4) $E' = p*l*[I-A]^{-1}*f'$

where, p is a diagonal matrix showing the ratio of base year labor productivity to

current year productivity. Now rural employment is generated by using the CBP matrix as:

5) $R = dE'^{*}C$

where, R is 524 by 51 matrix of rural employment of 524 sectors (in the row) for 50 states and the District of Columbia (in the column), dE' is a diagonal matrix of E', and C is a 524 by 51 matrix of rural employment share coefficients derived from the CBP (USDC/Bureau of Census, 1993). We allocate calendar year 1995 agricultural trade using a 1993 CBP share matrix because that is the latest available data. We use the results of equation 5 to estimate rural employment due to agricultural trade. We then aggregate 524 sectors to seven categories, three farm categories - Livestock, Grains & Oilseeds, and Other Crops—plus Food Processing, Manufacturing, Transportation and Trade Services, and All Other, for ease of presentation.

For the estimation, we derive the agricultural trade data from published USDA trade statistics (USDA/ERS/FATUS, 1996). Labor coefficients for each industry are derived using employment data from various issues of *Employment and Employment Earnings*, (USDL/BLS). To incorporate changes in labor productivity from 1987 to 1995, broad indexes of output per worker in each industry are used to adjust the estimate of required labor use.

This procedure is not perfect. Any regional estimation of a national effect, i.e., total employment due to agricultural trade, carries with it some implicit assumptions. In this case, distributing employment to the states according to the location of production will cause underestimations in areas where production is in surplus and the capacity and environment are already geared toward the movement and transport of agricultural commodities. We may also be missing some ancillary industries in regional economies that exist solely to facilitate exports and related input industries. With the Chicago Federal Reserve District including areas along the Mississippi and Great Lakes, these caveats may especially apply to the estimates presented in this paper. On the other hand, since the regional employment adds to a national total, we must be overestimating in regions that have some agricultural production but not enough to meet regional demands and/or in regions with adequate production but not the means to take advantage of added commodity exports. Regional models designed to capture the differences in regional economies, such as IMPLAN, RIMS, etc., have their own set of assumptions and conditions and have difficulty measuring national level impacts (Edmondson and Schluter, 1989).

V. Empirical Analysis of Chicago Federal Reserve Region Employment

Agricultural exports amounted to $55.8 billion in 1995, which was composed of $23.4 billion farm exports ($22.9 billion crops and $0.5 billion livestock), $21.0 billion processed food exports, and $11.4 billion other exports, e.g., manufactured tobacco, trade, and transportation services. We estimate these exports supported 895,000 full- time jobs, of which 292,000, almost a third (33%), were in nonmetro (rural) areas.

U.S. agricultural imports amounted to $21.6 billion in 1995, composed of $5.6 billion farm imports ($3.8 billion crops and $1.8 billion livestock), $11.3 billion processed food imports, and $4.7 billion other imports, e.g., manufactured tobacco

and misc. semimanufactured fibers. These imports represented the equivalent of 386,000 full-time domestic jobs if the imports had been produced domestically, according to our estimation. Of these 386,000 jobs, 118,000 or about 30%, would have been in nonmetro (rural) areas.

Figure 1 presents our estimates of employment related to U.S. agricultural exports in 1995. More than 143,600 jobs in the region can be traced to U.S. agricultural exports in 1995 (figure 1, next to last row.) Nearly 56,600 or 39.4% were jobs located in nonmetro areas and slightly more than 87,000 or 60.6% were in metro areas. While the Chicago Federal Reserve District labor force is less metropolitan-based than the national labor force (76.8% versus 80.8% nationally), the employment effect of agricultural trade on the District has an even smaller effect on metropolitan areas.

Within the District's five states, agricultural exports generated the most full-time jobs in Illinois, about 53,600 or 0.93% of the total employment in the state. Iowa, with 28,027 jobs, had the highest ratio (1.86%) within the five states, of jobs supported by agricultural exports and of rural jobs supported by agricultural exports (2.45%).

Feed grain and oilseed exports dominate these results. Two factors that affect estimates of rural employment are the percentage of nonmetro employment in each sector and the level of employment in those sectors of the economy. Nationally both feed grains and oilcrops are rural-based with nonmetro production shares of nearly 72% for each. And, as noted previously the five states dominate feed grain and oilseed production. These two facts about feed grains and oilseeds—predominately rural and concentrated in the Chicago Federal Reserve District underlie most of our results.

In the figure we listed seven aggregated sectors that show that even with the aforementioned dominance of feed grain and oilseed, employment related to agricultural exports covers a range of sectors. Nationally, the farm sector, as expected, receives most of the employment generated in rural areas from agricultural exports for two reasons. First, 13 of the 17 agricultural sectors in the national I/O accounts have more than 50% of their employment in rural areas and four (food grains, meat animals, oil bearing crops, and feed grains) have more than 70% of their total employment in rural areas. In 1995, 183,930 full-time farm jobs in nonmetro areas resulted from the $55.8 billion agricultural exports. This was 63% of total rural employment generated by agricultural exports. But there are 453,600 nonfarm metro and 108,000 nonfarm nonmetro jobs nationally and 70,900 nonfarm metro (including 9,500 food processing jobs) and 18,200 nonfarm nonmetro jobs (including 5,800 food processing jobs) in the Chicago Fed District supported by agricultural exports. This is due to the "indirect" effect of agricultural exports. That is, the effects of agricultural exports on the economy are not limited to the farm sector, but also affect "upstream and downstream sectors linked to agriculture by supplying its inputs and handling its products" (Harrington, Schluter, and O'Brien).

These indirect effects are important to rural communities. Some financial and economic stress that has characterized farms and rural areas in the 1980s can be traced to the volatility of export markets. During the 1990s, however, these markets have been expanding rapidly and prospects for more exports are good, considering the GATT, WTO, and regional pacts such as NAFTA.

Figure 1 Estimated Domestic Employment Equivalents of Agricultural Exports, 1995

Metro	Illinois	Indiana	Iowa	Michigan	Wisconsin	Chi-Fed	U.S. Total	Chi-Fed Share
Livestock	579	570	614	420	560	2,743	21,854	0.126
Grains & Oilseeds	4,911	3,298	1,515	1,141	430	11,295	28,914	0.391
Other Crops	221	216	15	1,285	411	2,148	98,549	0.022
Food Processing	3,053	1,155	2,315	1,463	1,505	9,491	50,649	0.187
Manufacturing	3,466	1,942	566	2,320	1,621	9,916	53,495	0.185
Trans & Trade	16,966	3,463	2,113	5,078	3,034	30,654	173,898	0.176
All Other	8,493	3,094	1,215	5,256	2,774	20,831	175,524	0.119
Total	37,689	13,738	8,353	16,963	10,334	87,077	602,882	0.144
Metro Employment	4,912,355	2,250,583	701,079	3,750,848	1,892,367	13,507,233	100,851,134	0.134
Share	0.0077	0.0061	0.0119	0.0045	0.0055	0.0064	0.0060	
Nonmetro								
Livestock	1,210	901	4,187	357	1,192	7,847	48,302	0.162
Grains & Oilseeds	10,270	5,212	10,329	970	916	27,697	76,414	0.362
Other Crops	463	341	100	1,093	874	2,870	59,227	0.048
Food Processing	1,168	878	2,325	401	1,017	5,789	33,603	0.172
Manufacturing	719	762	723	440	690	3,335	17,801	0.187
Trans & Trade	1,140	810	1,075	560	1,019	4,603	25,623	0.180
All other	992	720	935	799	985	4,431	30,926	0.143
Total	15,961	9,624	19,674	4,619	6,694	56,572	291,897	0.194
Nonmetro Employment	857,186	837,269	803,316	740,074	848,285	4,086,131	24,027,038	0.170
Share	0.0186	0.0115	0.0245	0.0062	0.0079	0.0138	0.0121	
Total								
Livestock	1,789	1,472	4,801	777	1,751	10,590	70,156	0.151
Grains & Oilseeds	15,180	8,511	11,844	2,111	1,346	38,991	105,328	0.370
Other Crops	684	557	114	2,378	1,285	5,018	157,776	0.032
Food Processing	4,221	2,033	4,640	1,864	2,522	15,280	84,252	0.181
Manufacturing	4,185	2,704	1,290	2,760	2,312	13,251	71,296	0.186
Trans & Trade	18,105	4,273	3,188	5,638	4,053	35,257	199,521	0.177
All Other	9,485	3,814	2,150	6,054	3,759	25,262	206,450	0.122
Total	53,650	23,362	28,027	21,582	17,028	143,649	894,779	0.161
Total Employment	5,769,542	3,087,852	1,504,395	4,490,922	2,740,652	17,593,364	124,878,172	0.141
Share	0.0093	0.0076	0.0186	0.0048	0.0062	0.0082	0.0072	

The Chicago Federal Reserve District is less affected by agricultural imports. If all the 1995 agricultural imports had been produced domestically, 56,000 more workers would have been needed in the five states, 35,200 metro jobs and 20,800 nonmetro jobs (figure 2). These lower import-related employment estimates result from both lower imports than exports (the positive agricultural balance of trade) and the lower importance of imported competitive commodities, such as sugar and fruits and vegetables, in the region. An exception is Michigan where its role in national fruit and vegetable production results in about half its nonmetro employment influenced by imports being in the "Other Crop" category (1,049 of 2,464).

The figure 2 import-related employment estimates are not estimates of jobs lost to imports. Such a study would require more sophisticated identification of imported products and the reason for their importation. Some may not have domestic counterparts. We present these estimates as a rough indication of import vulnerability. As such, even if one takes the extreme assumption that all import-related jobs replaced domestic jobs, the Chicago Federal Reserve District was 87,700 jobs (143,650–55,950) better off after agricultural trade in 1995. Rural areas were 35,740 jobs better off.

VI. Summary and Conclusions

Agricultural exports, like other exports, are sources of income and employment in the economy. Income and employment are generated as the sector produces goods and services to satisfy foreign demands. Agricultural trade, which had often been limited by many countries, has been moving toward multilateral and regional free trade through GATT agreements and the general acceptance of the WTO. This trade liberalization, which continues to open agricultural markets, should result in strong exports for U.S. products, with concomitant gains in employment for the Chicago Federal Reserve District.

An important lesson to emerge from this analysis is the significant interest that some rural areas have in the demand for agricultural exports. Agricultural exports require employment in rural industries, because rural areas possess a large share and level of employment in industries tied to both production (farm) and supporting (nonfarm) activities. More than 50% of the farm sector's employment was in rural areas (four subsectors are more than 70% rural). In 1995, 63% of the jobs supporting agricultural exports in nonmetro areas were on the farm. While this analysis emphasized employment effects, the primary export commodities in the region are capital intensive rather than labor intensive, so a labor-oriented measure of trade dependence may actually understate the importance of agricultural trade to rural areas of the region.

In the 1990s, the commodity mix of agricultural exports has changed. Rural employment and other economic benefits associated with agricultural trade will shift from the regions producing traditional bulk commodities to regions producing more HVP. This may have a significant implication for rural development policymakers. A region such as the Chicago Federal Reserve District that has a large share of rural employment due to agricultural exports may lose its dominant share over time as more HVP are exported. The metro areas of the region that had a relatively lower share of employment due to agricultural exports in 1995 (39%) may increase their share over time as more HVP, such as processed foods, are exported.

The estimates provided in this paper are valuable because they are sufficiently reliable, both conceptually and empirically, to make policy decisions based on them. Rural policymakers and rural planners often seek viable and defensible ways of assessing the role of agriculture in a rural economy and our analysis gives them information on how important agricultural exports are to regional rural employment.

Figure 2 Estimated Domestic Employment Equivalents of Agricultural Imports, 1995

Metro	Illinois	Indiana	Iowa	Michigan	Wisconsin	Chi-Fed	U.S. Total	Chi-Fed Share
Livestock	408	328	430	275	407	1,847	12,279	0.150
Grains& Oilseeds	826	558	267	191	89	1,930	4,775	0.404
Other Crops	262	196	17	1,234	392	2,101	58,579	0.036
Food Processing	1,820	543	689	846	1,101	5,000	30,815	0.162
Manufacturing	1,637	856	226	1,021	753	4,493	24,359	0.184
Trans & Trade	6,317	1,536	806	2,250	1,344	12,254	74,893	0.164
All Other	3,077	1,105	429	1,901	983	7,495	62,870	0.119
Total	14,345	5,121	2,866	7,718	5,069	35,119	268,569	0.131
Metro Employment	4,912,355	2,250,583	701,079	3,750,848	1,892,367	13,507,233	100,851,134	0.134
Share	0.0029	0.0023	0.0041	0.0021	0.0027	0.0026	0.0027	
Nonmetro								
Livestock	853	518	2,935	233	866	5,405	28,790	0.188
Grains & Oilseeds	1,727	881	1,818	162	190	4,778	12,431	0.384
Other Crops	547	309	119	1,049	835	2,859	32,959	0.087
Food Processing	450	340	897	297	758	2,742	13,729	0.200
Manufacturing	350	382	262	190	308	1,492	7,766	0.192
Trans & Trade	490	358	475	245	451	2,019	11,091	0.182
All Other	351	254	315	288	326	1,534	10,749	0.143
Total	4,768	3,041	6,822	2,464	3,734	20,829	117,587	0.177
Nonmetro Employment	857,186	837,269	803,316	740,074	848,285	4,086,131	24,027,038	0.170
Share	0.0056	0.0036	0.0085	0.0033	0.0044	0.0051	0.0049	
Total								
Livestock	1,261	845	3,366	508	1,272	7,252	41,069	0.177
Grains & Oilseeds	2,553	1,439	2,085	353	279	6,708	17,206	0.390
Other Crops	809	505	137	2,282	1,227	4,960	91,538	0.054
Food Processing	2,269	883	1,586	1,143	1,859	7,742	44,544	0.174
Manufacturing	1,987	1,238	488	1,211	1,061	5,985	32,125	0.186
Trans & Trade	6,807	1,894	1,282	2,496	1,795	14,273	85,984	0.166
All Other	3,428	1,358	745	2,189	1,310	9,029	73,619	0.123
Total	19,113	8,163	9,688	10,182	8,803	55,949	386,156	0.145
Total Employment	5,769,542	3,087,852	1,504,395	4,490,922	2,740,652	17,593,364	124,878,172	0.141
Share	0.0033	0.0026	0.0064	0.0023	0.0032	0.0032	0.0031	

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Ms. Kaptur: I know I have spent a great deal of time trying to convince people in foreign policy fields outside of USDA that we need to develop agriculture in countries like the Ukraine, where more than 50% of the economy is based on agriculture, or in Lebanon, where we have a moral obligation to help replace old illegal crops like hashish with productive crops that can serve as the basis for local development. Have you ever done any international studies of the impact of agriculture on rural development, and in turn on national development?

Response: ERS has indirectly focused on the impact of agriculture development on rural development and national development in foreign countries. Many developing countries have a large share of their populations engaged in agriculture and living in rural areas. For these countries, agricultural development has a large impact on rural and national development. Policies play an important role in stimulating agricultural development and economic growth.

With land becoming increasingly scarce in developing and transition countries, it is important that they develop their agricultural sector by increasing agricultural productivity. ERS has been engaged in research on productivity and efficiency issues for both Ukraine and Russia since the reform period began, measuring productivity trends and then explaining them with institutional policy and economic variables. ERS also is developing natural resource indicators that are being used to help assess productivity trends for countries in Sub-Sahara Africa and South Asia.

Ms. Kaptur: I was interested in your statement that ERS will work with FAS and USTR to assure that agricultural negotiations under the auspices of the WTO are successful and advantageous for U.S. agriculture. How do you define "successful and advantageous"? Is this in a macro sense, or does it come down to the pluses and minuses to individual communities? What happens if your definition of success doesn't match the definition of some other foreign policy force that does not have a portfolio in agriculture?

Response: One of the roles of the Economic Research Service (ERS) is to provide an objective analysis of policies that affect U.S. agriculture. ERS is working with policy makers in agencies responsible for U.S. trade negotiations on Agriculture and provides them with analyses on the Uruguay Round Agreement on Agriculture (URAA) or on different policy options. A recent ERS publication, *Agriculture in the WTO,* discussed progress of the URAA.

A successful and advantageous outcome to agricultural negotiations would be one that would make substantial progress in reducing trade distortions that prevent U.S. farmers from competing on an equal basis in world markets. Article 20 of the Uruguay Round Agreement on Agriculture (URAA) noted that long-term fundamental reform would require continual reduction of agricultural support and protection. The U.S. position for the 1999 Ministerial Conference had four general objectives for negotiations on agriculture: increase market access, eliminate all export subsidies, further reduce domestic support, and ensure that trade in agricultural biotechnology products is based on transparent, predictable, and timely processes. U.S. agriculture will broadly benefit from fewer global agricultural trade distortion because by and large the U.S. is a low-cost, efficient producer. However, it must be acknowledged that a few sectors of the U.S. farm economy have benefitted from relatively high levels of support, and that

an across-the-board elimination of all trade-distorting support and protection could result in adjustment costs for these more highly protected sectors. ERS is prepared to work with our partner agencies to provide an honest appraisal of the commodity-specific as well as sector-wide costs and benefits of options for agricultural negotiations.

When our definition of success does not match the definition of some other foreign policy force that does not have a portfolio in agriculture, the interagency decision-making process, where possible, is required to resolve these conflicts. ERS, as a participant in the Agriculture Subcommittee of the Trade Policy Staff Committee (TPSC), contributes to interagency staff discussions on agricultural trade policy. ERS has provided several briefings for subcommittee members on analytical issues relevant to the work of the subcommittee. Policy differences involving agencies not represented at the TPSC are resolved at the highest level of government. In both instances, ERS provides the analysis policy makers need to make the best informed decisions about possible outcomes for agricultural and trade policy.

Global Research and Outreach Initiative

Ms. Kaptur: I am interested in your global research and outreach initiative. Can you describe for us the nature of your collaborative activities with institutions, and exactly how you will facilitate "long term exchanges"? I agree that to be effective international relations have to be on a long-term basis. But other agencies of USDA have told me that the lack of multi-year funding makes such efforts difficult at best, if ever possible. How will you structure these programs to avoid that problem?

Response: It is probably not possible to avoid the problem associated with annual funding when attempting to develop long-term relationships. However, we believe it is possible to structure the program so as to minimize the negative impacts. First, it is important to recognize that only a fraction of our collaborative activities will involve long-term staff exchanges and some of those will be with institutions in developed countries which will fund their share of the costs of collaboration or, at least, a major part of it. We will in all cases be focusing our activities on problems and issues that are of mutual interest to both parties. For those activities involving exchanges with institutions from poor, developing countries, we are able to fund multi-year cooperative research projects. This, of course, reduces the number of activities that can be initiated in any one year. It is also important that we succeed in identifying and focusing the program on issues that are truly important to both countries so that the institutional relationships mature over a few years to the point that they are of sufficient importance to the collaborating institution that only minimal funding will be required. We would not expect that the relationship with any one institution would involve perpetual staff exchange.

Nutrition Studies

Ms. Kaptur: Your description of the activities you are undertaking regarding nutrition and nutrition education doesn't seem to describe the impact of a $12.2 million reduction in funds that are proposed to go back to FNCS. How much money will you have left for this activity if

the transfer of the $12.2 million is approved?

Response: The President's budget proposal for FY 2001 moves $12.2 million from the Economic Research Service to the Food and Nutrition Service. This will completely eliminate our extramural research program on domestic food assistance and nutrition programs.

Ms. Kaptur: Will only the dollars, or will other resources and personnel be transferred back to FNCS? If you have the people and the resources, I don't know if they can achieve the same work product for $12.2 million unless they have similar resources. What is your assessment of this situation?

Response: The President's budget requests only that the funds and not personnel be transferred to FNCS. If the request is approved, FNS will have the resources necessary to conduct this research program.

Anti-Hunger and Food Security Grants

Ms. Kaptur: You are also proposing to award anti-hunger and food security grants to nonprofit organizations to help bolster food systems and fight hunger. Who will be eligible to apply for these grants, will there be a maximum size, and can you give us examples of projects likely to be considered for this program?

Response: The grants would be made available to any nonprofit group in the United States, including faith-based organizations. Such groups could include:

food banks;
church, synagogue, mosque, or temple-based soup kitchens or food pantries;
community food security groups;
nonprofit small farmer or sustainable agriculture groups;
food recovery, food rescue, or gleaning organizations;
community gardening groups;
job training, assets development, and micro enterprise organizations;
community action agencies;
youth service organizations;
nutrition education groups;
nonprofit farmers' markets and direct marketing organizations.

The maximum grant size would be determined after the amounts of the final Congressional appropriation is determined; however, if Congress appropriate the full $5 million requested, it is likely that the maximum grant size would be roughly $250,000. The intent of the program will be to give out as many small and medium-sized grants as possible to provide seed money that the grants recipients will be able to use to leverage other resources.

Priority would be given to innovative public/private partnerships that comprehensively tackle local problems, as well as for the replication of successful model programs. Nonprofit groups have consistently commented that government and foundation funding that often focuses only on new — and unproven projects — is not always wise public policy, particularly when the funding streams will not fund the replication of programs that have proven their effectiveness. Thus, these grants will place a significant focus on helping nonprofit groups replicate projects that have already proven their effectiveness.

Below are some examples of the types of projects that may be funded by the grants.

- Helping food banks, soup kitchens, and food rescue organizations collect excess food from school meals programs and work with schools to engage students in hunger-related volunteer activities; such grants would build upon the success of a recent, limited USDA effort to help groups and schools start or expand such efforts.

- Enabling local emergency feeding organizations, who usually focus on the short-term goal of providing food to clients, to increase their focus on longer-term and broader community food security activities that both help their client move to self-sufficiency and

strengthen local food systems.

- Assisting small and medium-sized farmers to sell their agricultural products directly to school districts, government hospitals, public universities, and other public institutions; these projects have the potential to boost the income of struggling family farmers at the same time they provide students and others with improved nutrition by being able to eat fresher products.

- Starting or expanding community or school gardens that enable low-income residents to produce their own food; such projects can help increase community self-reliance, increase the availability of fresh produce in low-income areas, preserve open space, teach young people about science, and even create "safe spaces" that reduce crime.

- Strengthening the infrastructure of food banks, food recovery organizations, food rescue groups, and field gleaning organizations necessary to increase the quantity and/or quality of the excess food that is recovered and gleaned; funds could be used for:
  a) vehicles and fuel for transportation of recovered food;
  b) Volunteer coordinators as well as training programs for volunteers;
  c) preparing, printing, and distributing handbooks, and instructional materials;
  d) heating and refrigeration equipment to ensure the safety of the recovered food;
  e) equipment to collect, sort, process, dehydrate, transport, and distribute food.

- Supporting peer-to-peer efforts in which senior citizens provide nutrition, food, and other assistance to fellow senior citizens.

- Helping youth service or other community organizations increase the involvement of community volunteers in anti-hunger and community food security activities. This would advance the volunteerism goals set jointly by President Clinton, former President Bush, and former General Colin Powell. Funds could be used for the hiring of staff to recruit and supervise volunteers, as well as for training programs for volunteers.

- Supporting the creation of new or expansion of existing community kitchens, such as DC Central Kitchen, that combine rescuing excess food with training low-income individuals for jobs in the food service industry; such programs have been extremely successful in helping individuals move from poverty and homelessness to self-sufficiency and independent living.

- Increasing connections between farmers' markets and other local food security and anti-hunger activities.

- Enabling community groups to team up with local universities to comprehensively map all food security-resources in their community and then conduct outreach to ensure that more community residents utilize those resources.
- Expanding programs that engage chefs as volunteer nutrition education instructors and tying nutrition education and financial management training classes into broader

community food security efforts that comprehensively help low-income families.

- Supporting the development of small, food-related businesses and micro enterprises in low-income communities, such as youth farm-stand programs or efforts in which products grown in local gardens are turned into products, such as salad dressing or baked goods.

- Providing increased food and assets development assistance to help working poor families to stay off of welfare, increase their ability to feed and support their families, and eventually move into the middle class

Ms. Kaptur: If these are to be research grants, do you see yourself financing demonstration hunger programs, or reassessing the application and other procedures used by states or the Food, Nutrition and Consumer Services in securing program participants? FNCS told us recently that they were concerned about the declining participation in food stamps. This may merit some type of study.

Response: USDA, particularly through the Economic Research Service, has been studying this issue intensely. This issue in prominent in the 1999 USDA Study Agenda for REE and the agency has a number of ongoing studies on this topic, including:

"Program Access & Declining Food Stamp Program Participation"
"What Explains Recent Changes in Food Stamp Program Caseload?"
"The Effects of Welfare Implementation on Food Stamp Caseloads;" and
"Restructuring Food Stamps to Help Working Families."

Based on data on this topic from a wide variety of sources — preliminary data from such work, from the ongoing program management work of the Food and Nutrition Service, from studies conducted by non-USDA sources, from media reports, and from reports from food banks about their rising demand for food — USDA is very concerned about the impact of the decline in Food Stamps participation among eligible families. On one hand, it is good news that many low-income families have been able to leave the Food Stamps program after moving from welfare to work and because of general increases in family income as a result of the strong economy. On the other hand, it is troubling that Food Stamps participation has dropped far more rapidly than the drop in the rate of poverty. We know that many families — and particularly working poor families and families with senior citizens — are entitled to receive this critical nutritional assistance but are not receiving it. That is why the Department FY 2001 budget proposes $10 million to be distributed by the Food and Nutrition Service for outreach on Federal nutrition assistance programs. However, because such funding is proposed in the Food and Nutrition Service budget, it is anticipated that little of the funds provided for the proposed Anti-Hunger and Community Food Security grants would go to such purposes.

FOOD QUALITY PROTECTION ACT

Ms. Kaptur: Secretary Gonzalez, you also highlight for us the fact that you want $25.4 million to increase your focus on providing EPA information and data "essential for science-based implementation of FQPA." Again, can you expand on this point? Are you developing new or additional information with these funds, or are you establishing a dissemination system?

Response: In addition to information and data, the funding would be used to develop and deliver the pest management tools of the future. The focus of our efforts will remain on minor crops (fruits and vegetables) where there are few options to the pesticides currently under review by EPA. The research is needed now to provide growers with the tools that will allow them to transition to newer and safer pest management strategies. The budget calls for an additional $4.12 million for Agricultural Research Service (ARS) research programs in areawide Integrated Pest Management (IPM) and Methyl Bromide alternatives. Additional funding is also requested for the Office of Pest Management Policy (OPMP). OPMP provides a critical link between EPA and the Department on pest management regulatory issues and works to integrate the various USDA agencies activities on pesticide matters.

The bulk of the funding increase is contained in the CSREES budget proposal. Increases are sought in research to develop alternative pest management systems and tools for crops that are particularly vulnerable due to the loss of currently registered pesticides. As a result of consumer demands and FQPA implementation, growers face continuing pressure to adopt newer and safer pest management techniques. The research and education programs contained in the request are critical for achieving that transition, as described below. Specific research programs include the Pest Management Alternatives program (PMAP), Crops at Risk (CAR), Risk Avoidance and Mitigation Program (RAMP), and the Methyl Bromide Transition Program (MBTP).

PMAP focuses on short-term solutions to pest management problems. Generally, the program investigates ways to effectively utilize alternative registered products in lieu of those products that are identified as high risk.

CAR is an intermediate-term research program intended to produce effective pest management tools for particularly vulnerable crops. Unlike PMAP , this program anticipates the need for field research that may require one or two growing seasons to collect.

RAMP is a longer-term research program that approaches pest management on a broader cropping system basis that includes major crops as well as those commodities most consumed by children. We anticipate system approaches that incorporate any number of crop production practices including water and nutrient management.

MBTP compliments the ARS research program by increasing the involvement of the university system in the research, education, and adoption of alternative pest management systems and tools.

Each of these programs will require grower involvement and contains an information dissemination component that will involve the existing State Extension System.

In addition to these research programs, the CSREES budget increases will enhance our ability to collect the pesticide residue and other information needed by EPA to register new products for minor crops through the Inter-regional Project Number 4 (IR-4) Program. This program is critical to bringing new technology to the producers of minor crops. We are also seeking funding to increase our ability to deliver pesticide applicator training programs and, through a competitive process, create prototype Regional Information and Policy Centers. A new competitive grants program to facilitate the transition to organic production is also included.

Also proposed is an increase in the National Agricultural Statistics Service (NASS) budget to expand pesticide use and pest management practices data collection activities to address existing data gaps for a number of field and specialty crops. The data are used by EPA in the risk assessment process and by the Department in developing practical, real world risk mitigation strategies. As a result, actual grower use practices are factored into the risk assessment and mitigation processes.

In summary, most of the requested increases are devoted to the research and application of new pest management tools and systems--many of which are data and information intensive. The intent of these programs is to develop the pest management information needed by farmers and ranchers. Because timely adoption of these new tools is essential to the success of the program, each contains an information dissemination component. We are not establishing any new information systems. We believe that continued cooperation with the existing State Extension System is the most efficient and effective means of insuring that research results are translated into action.

The program components that are primarily information and data oriented are targeted at specific needs and include funding for the Office of Pest Management Policy (OPMP). OPMP will continue the development and maintenance of Crop Profiles that provide baseline agricultural production and pest management information to a wide variety of customers, including EPA, the states, and the research community. To date, 250 profiles are available on the Internet. In addition, OPMP is working with grower organizations, land-grant institutions, and other crop production experts to develop Pest Management Strategic Plans that document and establish priorities for research and new product registration. The information developed by these efforts establishes the framework for growers and government to work together towards the common goal of safe and effective pest management.

The NASS pesticide use data adds to the current system that provides important risk assessment and mitigation data to the EPA and to other USDA agencies.

The IR-4 program develops the data and information needed to support minor crop registration. These markets do not attract registrant interest because they are too small to justify the added cost of the data. The IR-4 program provides this critical service and the proposed increase is needed to keep pace with the loss of existing chemicals.

Ms. Kaptur: To the extent you are developing information for EPA, why is the request in your budget and not theirs?

Response: As outlined in response to the previous question, the bulk of the increase is directed toward research and education efforts needed to develop and deliver science-based pest management tools to growers. Other data and information support the overall goals of several programs and customers including EPA. We believe that USDA has the existing networks, expertise, and experience to most efficiently gather and disseminate the information to our multiple partners and customers.

For EPA to move into these areas of research and data collection would require a significant investment in recreating the infrastructure that currently exists within USDA.

Ms. Kaptur: I am sure you are familiar with the recent 60 Minutes story regarding the inclusion of MTBE - mythyl tertiary butyl ether - as a component of oxygenated fuels used in nine cities which face the worst air pollution. Ethanol could be substituted for MTBE to the benefit of both the environment and our farmers. With this market opportunity because of the concerns about MTBEs in front of us, what can you do to more effectively promote ethanol and other biobased fuels? Have we yet moved from research to a promotional phase?

Response: The U.S. Department of Agriculture can do two things to enhance the markets for ethanol and other biobased fuels. First, USDA can help lower the cost of production through research. For example, our researchers believe we can reduce the cost of making ethanol by 9 to 15 cents per gallon. Additional savings of 13 to 18 cents per gallon may be possible by developing coproducts from raw material not used up in ethanol production. Second, USDA can work with other government agencies and within the Administration to provide information on the net benefits of biobased fuels and suggest policies that will enhance biobased fuel use. For example, the USDA Office of Energy Policy and New Uses (OEPNU) has provided analysis that shows the net energy balance of ethanol and biodiesel are positive and that corn and cellulosic ethanol and soybean biodiesel reduce adverse greenhouse gas emissions relative to petroleum products. In addition, OEPNU has proposed national oxygenate averaging for reformulated gasoline to EPA rather than the current system of requiring 1.5 percent volume of oxygenates per gallon. Such a rule change could allow more ethanol to be used in reformulated gasoline. EPA is proposing such a rulemaking now. Further, Secretary Glickman and Administrator Browner, EPA, proposed a Renewable Fuel Annual Averaging Content provision on March 20 to maintain and expand ethanol use for transportation fuel. This provision was part of a broader legislation proposal to remove MTBE from transportation fuel use.

Further research is needed to continue to reduce the cost of corn ethanol and especially cellulosic ethanol. The promotional phase is appropriately handled by the ethanol industry and farm and rural groups.

In addition, the Department has proposed to make $150 million available in FY2001, an increase of $50 million above 2000, to provide bioenergy incentive payments to encourage production of fuel grade ethanol and biodiesel from grain and soybeans, respectively.

Ms. Kaptur: Recent reports have suggested that gasoline prices may rise to between $2 and $2.50 per gallon this year. Ms. Offutt, has the Economic Research Service done any work to determine what is the price at which ethanol or other biobased fuels become not only attractive, but also necessary?

Response: This question relates to an area that is the responsibility of the Office of Energy Policy and New Uses (OEPNU), which is located in the Office of the Chief Economist. OEPNU analysis suggests that at current gasoline prices, ethanol is not only attractive but necessary now. The U.S. average price of ethanol for April 17, 2000 was $1.27 per gallon. Minus the excise tax exemption, the price terminal blenders pay is 73 cents. Last year the domestic ethanol industry set a new record for production during February, averaging over 108,000 barrels per day of the month. That is equal to 4.5 million gallons of ethanol per day.

Over 131 million gallons of ethanol were produced in February - enough to oxygenate 2.3 billion gallons of reformulated gasoline (RFG) or 71 percent of the RFG sold in January. At permanent gasoline prices between $2.00 and $2.50 per gallon, ethanol capacity could be expected to expand considerably, all things being equal. DOE has also set a goal of replacing 10 percent of transportation fuel with cellulosic ethanol by 2010. Increasing the supply of ethanol reduces gasoline prices. In 1988, the American Petroleum Institute estimated that ethanol use reduced the price of conventional gasoline by 0.77 percent.

QUESTIONS SUBMITTED BY MR. DICKEY

Mr. Dickey: Can you please discuss what criteria the Agricultural Research Service used to recommend the termination of the National Rice Germplasm Center?

Response: The Dale Bumpers National Rice Research Center, Stuttgart, Arkansas, is not being recommended for termination or closure. The fiscal year 2001 budget does contain a proposed decrease of $425,005 which was added on by the Congress in fiscal year 2000 for a rice molecular biology project focused on reducing weather-related losses caused by drought, high temperature and salinity. This is part of the proposed terminations of ongoing projects totaling $42.4 million required to finance new and expanded research initiatives critically needed in fiscal year 2001.

Mr. Dickey: With the suggested termination of the national rice germplasm center, how do you suggest meeting the research needs of rice farmers?

Response: Let me reiterate that the National Rice Research Center is not being proposed for termination. ARS will continue to conduct research at this Center, which was recently completed, on important needs of rice farmers including genetic improvement of rice for grain quality, yield, pest resistance, drought and high salt tolerance.

Mr. Dickey: Can you please discuss the criteria the Agricultural Research Service used to recommend the termination of the Stuttgart National Aquaculture Research Center and UAPB Aquaculture Research Center?

Response: ARS did not recommend closure of the Stuttgart National Aquaculture Research Center and the UAPB Aquaculture Research Center. The President's budget calls for termination of $501,900 for program support for the Stuttgart National Aquaculture Research Center and $425,005 in funding of the UAPB Aquaculture Research Center.

The President's fiscal year 2001 budget proposed a net increase of $63.9 million over the fiscal year 2000 Appropriations Act. The President proposed funding 14 new initiatives in ARS. While aquaculture is recognized as a high priority issue for producers, the funding of new, higher priority programs required that ARS propose the termination of other programs.

The fiscal year 2001 budget proposal includes program increases in the amount of $97.8 million plus an additional $8.5 million for pay costs for a total of $106.3 million. Only $63.9 million was added to the proposed fiscal year 2001 ARS budget to cover their increases. To cover the difference, the proposal also included $42.4 million in program reductions including $4.7 million in aquaculture research, which included reduction of $501,900 in funding for the program of the Stuttgart National Aquaculture Research Center and $425,005 in funding of the UAPB Aquaculture Research Center.

Mr. Dickey: With the suggested termination of this aquaculture research, how do you suggest meeting the research needs of the aquaculture industry?

Response: ARS will meet the research needs of the aquaculture industry by addressing within appropriated funding the highest priority research problems identified by stakeholders, customers, and partners.

Mr. Dickey: Rice and aquaculture sectors are competitive and growing sectors that require adequate investments in research to remain competitive globally. To obtain top researchers and ensure quality results, the science community demands stable funding over a number of years. Today's research

took years of investment to develop, an investment that would be forever lost if we followed your recommendation. By recommending the termination, are you not threatening the quality and depth of this investment along with the future ability of the Agricultural Research Service to adequately support future research on rice and aquaculture?

Response: ARS has been successful at recruiting highly qualified scientists to the rice and aquaculture programs and has maintained the programs' relevancy and high performance in meeting the research needs of the rice and aquaculture industries.

Mr. Dickey: What research has ARS done on the potential impact of the EPA requiring farmers to obtain water discharge permits?

Response: ARS research has a major impact on a limited number of water discharge permits issued under the EPA National Pollution Discharge Elimination System. The ARS Water Quality and Management National Program has provided many new and innovative practices and agricultural systems to address problems associated with nutrients from fertilizer, pesticide, and sediment contamination in surface waters and/or groundwaters. Research has also been initiated to address concerns related to nutrients from manure, pathogens, trace elements and pharmaceutical or other synthetic organic chemical pollutants coming from confined animal feeding operations. A number of water quality models have been tested and evaluated for predicting contamination risks and evaluating methods to reduce water quality problems. Within the Midwest, field, farm and watershed management research has been conducted for the past 9 years to develop farming systems that reduce contamination hazards from fertilizer and pesticide use. However, the site-specific nature of the increasing amount of water quality problems throughout the nation has left many farmers and ranchers without economical alternatives or strategies. In the fiscal year 2001 budget, ARS is requesting $6.8 million for water quality protection and management strategies in the following areas: Research and Monitoring ($600,000); Eutrophication, Harmful Blooms and Hypoxia ($3,850,000); Livestock Manure Management Systems ($900,000); Manage and Restore Riparian Zones and Coastal Habitats ($900,000); and Integrated Risk Assessments ($550,000). ARS is highly recognized for its accomplishments in the Water Quality and Management National Program, along with its cooperation and collaboration with CSREES and State Agricultural Experiment Stations, NRCS, ERS, USGS, and EPA.

QUESTIONS SUBMITTED BY MR. BONILLA

Mr. Bonilla: What are your plans for utilization of the new Plant Stress and Water Conservation Laboratory located in Lubbock, Texas, since the budget proposal cuts funding for the research currently being conducted at the lab?

Response: The fiscal year 2000 appropriation provided an increase of $750,000 for the Plant Stress and Water Conservation Laboratory. Of this amount, $112,493 was rescinded in fiscal year 2000 as part of the 0.38% rescission. The remaining $637,507 is proposed for termination in the fiscal year 2001 budget. As newly appropriated funds for the current fiscal year, the $750,000 was intended to support new research efforts in plant molecular biology and soil and water conservation, for which the scientific staff has not yet been recruited. The proposed termination does not affect other research currently being conducted at the laboratory.

The plans for the laboratory are that it will host staff of both USDA-ARS and Texas Tech University. Research programs will be cooperative efforts of USDA-ARS and Texas Tech University, with full participation also by the Texas Agricultural Experiment Station. The costs of operating the laboratory will be borne by ARS within existing budgets.

Mr. Bonilla: In the FY 2001 budget for ARS, what is the total amount of funding targeted for research in grains and livestock?

Response: In the fiscal year 2001 budget, ARS research funds targets for grains are $63,109,100 and for livestock are $170,300,800.

Mr. Bonilla: Please explain the reasoning behind any budget cuts or termination of research for grain sorghum.

Response: The fiscal year 2001 Administrative budget includes a budget cut of $143,400 for an ARS research project on viral diseases in sorghum at Lincoln, NE. The scientist leading this project recently retired. There were insufficient funds to adequately support refilling the position, so funding was redirected to higher priority problems.

Mr. Bonilla: How will the money provided to the Weslaco, Texas center for grain sorghum research be spent and how was the decision made to send the money to the Weslaco lab?

Response: A new 5-year plan has been written for a Weslaco research program that includes new research on the Mexican rice borer. This insect is a potential threat to grain crops including sorghum. The new research will include evaluation of the effectiveness of a parasitic fly as a biological control agent for the Mexican rice borer.

Mr. Bonilla: What progress has been made in creating new research positions for grain sorghum in Lubbock, Texas and Manhattan, Kansas?

Response: Funding is not sufficient to create new research positions, but new research relevant to grain sorghum has been initiated. At Lubbock, Texas, new methods are being developed to identify grain sorghum lines that can tolerate higher temperatures. The new methods are being used to evaluate sorghum germplasm collections and to assist in genetic selection of new grain sorghum varieties that are more thermotolerant. At Manhattan, Kansas, new methods to optimize on-farm storage of grains including grain sorghum are being developed. These new methods include the use of temperature monitoring and low-temperature control during grain storage to reduce insect damage.

Mr. Bonilla: Please provide an explanation as to how funding for grain sorghum is distributed to different research centers across the country.

Response: The distribution of the current funding for grain sorghum will be provided for the record.

[The information follows:]

Location	Program	FY 2000 Funds
Frederick, MD	Identification and characterization of emerging foreign plant pathogenic fungi.	$105,400
Wyndmoor, PA	New biobased products to increase demand for grains.	96,700
W. Lafayette, IN	Molecular and genetic mechanisms of fungal disease resistance in grain crops.	76,300
Ft. Collins, CO	Preservation of base plant germplasm collection.	178,000
Manhattan, KS	Improved handling and storage systems for grain quality maintenance and measurement.	58,600
Lincoln, NE	Genetic improvement of sorghum for feed quality and agronomic fitness.	583,200
College Station, TX	Evaluation and enhancement of sorghum germplasm. Identification and control of fungal diseases of sorghum.	599,200
Weslaco, TX	Biologically-based management of insect pests of subtropical crops. Biological control of exotic and invasive pests of agricultural importance.	234,200
Temple, TX	Sustainable agriculture production systems for clay soils.	63,000
Lubbock, TX	Plant response to water-deficit and thermal stresses. Novel germplasm development for water-deficit and thermal stress environments.	164,100
Stillwater, OK	Biologically based management systems for the Rusian wheat aphid and other cereal aphids. Biology, ecology, and managment of cereal aphids.	107,000
Stoneville, MS	Development of technology for efficient crop production systems.	81,700
Tifton, GA	Genetic improvement of corn and sorghum for resistance to insects and aflatoxin. Plant resistance and germplasm enhancement for managing insect pests of southern corps. Develop/integrate alternative pest management strategies using natural enemies and genetic approaches.	180,500
Griffin, GA	Crop conservation and genetic analysis.	300,700

Athens, GA	Sensing moisture content and quality of grain and other agricultural products by dielectric properties.	46,100
Gainesville, FL	Genetic and molecular investigations of gene expression in maize and sorghum.	255,500
Mayaguez, PR	Growout of quarantined plant germplasm for the national plant germplasm system. Introduce, increase, evaluate and enhance sorghum germplasm.	430,900
Headquarters	Sorghum ergot research.	300,000
	Total	$3,861,100

SECONDARY AGRICULTURE EDUCATION

Mr. Bonilla. Please provide an update on your efforts to work with secondary agriculture education teachers on the development of instructional materials.

Response. The first competition of the Secondary Agriculture Education Challenge Grants Program held in fiscal year 1999 resulted in 73 proposals requesting $1.02 million. Thirty-seven grants in 16 states were funded for a total of $472,500. Of the funded projects, fifteen include the design or modification of instruction materials. Activities range from adapting materials to fit local agricultural conditions to restructuring curricula to meet State educational standards. Many projects include experiential learning components. For example, a teacher in Texas has students conduct applied research on prairie dogs as part of a Natural Resource Management class.

National grants writing workshops were conducted at the Future Farmers of America convention in Kentucky, the National Association of Agricultural Educators convention in Florida, and the Urban Agriculture Conference in Washington. D.C. Regional workshops were conducted in Missouri, Illinois, Oklahoma, and Arizona. Guidance and direction were provided to university faculty who conducted State-level grants writing classes and workshops.

The Agriculture in the Classroom--AITC--program provides an additional avenue for reaching secondary teachers. By placing information regarding the Secondary Agriculture Education Challenge Grants program on the AITC web site, over 120,000 teachers were reached. The web site is a distribution method to extend results beyond the funded projects to a wider audience. AITC also supports secondary agricultural education through a cooperative agreement project with Florida A&M University to identify and develop lesson plans on the contributions of minorities to the food and agricultural sciences. Minorities constitute the fastest growing segment of the population, yet remain significantly underrepresented in the food and agricultural sciences.

EDUCATION

Mr. Bonilla. Does the U.S. Department of Agriculture plan to continue collecting and publishing data regarding national employment opportunities in agriculture and would they be interested in cooperating with the U.S. Department of Education and/or the U.S. Department of Labor to expand the study to include employment data for secondary and two-year post-secondary graduates?

Response. Due to streamlining efforts of the Higher Education Programs Office, the employment opportunity study has not been done internally since the late 1980's. Instead, we have worked with the university system to develop a methodology for replication of a national assessment of employment opportunities every five years. Through a cooperative agreement with a university, we provide financial support of $84,000 to publish and disseminate the report. The university, in turn, is responsible for establishing a task force to use this standardized methodology for replicating the study every five years. In addition, we generally provide advice and guidance to the task force and designate a Higher Education staff person to serve on the task force.

The employment opportunity study is very useful source of career information for counselors and educators of high school and two-year post-secondary students, the students' parents, and for students who intend to pursue a baccalaureate in the food and agricultural sciences. It is not intended to serve the needs of those whose terminal degrees is at the high school or associate degree level.

USDA has neither the expertise nor the authority to directly address the needs of those whose terminal degrees are at the high school or associate degree level. However, we would be willing to provide guidance to the Department of Education and/or the Department of Labor on how to adapt our methodological procedures to such studies. Additionally, we would be willing to have a staff person serve on or as a consultant to a task force conducting such studies.

EDUCATION
FOOD, LAND, AND PEOPLE

Mr. Bonilla. Please provide a detailed description of all work that has been done with Food Land and People and an accounting of all Federal funds they have received.

Response. The Research, Education, and Economics--REE--Mission area has provided the following funding to the Food Land and People--FLP--effort

$ 5,000 in 1991 for development and review of FLP's Resources for Learning --RFL-- Conceptual Framework.

$13,000 in 1994 for development of first 40 RFL lessons.

$37,000 in 1995 for piloting the second editing of the first 40 RFL lessons with Ag in the Classroom network.

$ 5,700 in 1997 for writing and piloting two new RFL lessons -Trading Favorites- and -Global Grocery Bags-.

$ 7,000 in 1998 to enhance two new RFL lessons -Soil's Not Trivial- and - What Piece of
Pie-.

$70,000 in 1999 for state FLP coalition building and teacher training workshops.

QUESTIONS SUBMITTED BY MR. LATHAM

WORKING WITH THE ENVIRONMENTAL PROTECTION AGENCY ON FQPA IMPLEMENTATION

Mr. Latham: As the EPA and USDA work to implement the Food Quality Protection Act, many questions remain concerning the prospects of retaining pesticides for crop uses and public health uses.

What effort is the USDA making with EPA to protect and preserve important pesticide uses?

Response: When EPA finds an unacceptable risk, USDA works closely with EPA, grower organizations, land-grant institutions, and other crop production experts in the Agricultural Research Service and in other public and private sectors to determine if changes in the use pattern can mitigate the risk to acceptable levels. Frequently, reductions in the maximum allowable application rates can result in acceptable risk. When worker risk is at issue, USDA has worked with research and growers, to determine that additional protective equipment, new packaging, or increased re-entry intervals can be effective risk mitigation tools. If the dietary risk remains unacceptable, we focus on those crops that contribute the majority of the risk and determine if cost-effective alternative pest management chemicals and practices are available. This approach allows EPA to mitigate the risk while preserving minor uses that contribute little to the overall risk of the chemical. The process we have established with EPA assures that important pesticide uses are identified and preserved if at all possible. USDA is also working to identify critical pest management research in the future by developing Pest Management Strategic Plans for key crops. These plans will clearly identify the research, registration, education, and training priorities so that effective pest management tools are available in the future.

Mr. Latham: Is the Department satisfied with the EPA's response to agriculture's current pesticide needs under FQPA?

EPA has been very receptive to the issues we have raised and the additional data we have supplied. Our ability to facilitate EPA's access to the expertise of the Department and the land-grant institutions has resulted in better decisions that reflect actual agricultural practices.

AGRABILITY

Mr. Latham. As you know, I am a strong supporter of the AgrAbility program. I was disappointed to see that the program took a 15 percent reduction in fiscal 2000 funds to help meet the 0.38 percent departmental budget reduction goal. Will you please detail how you envision growing this program in the future and how we can help you do that?

Response. The AgrAbility program budget was increased by approximately 26 percent in fiscal year 2000 over fiscal year 1999 after the recission. We envision the program continuing to grow through partnerships with other State, Federal, and private organizations to leverage the base support for the AgrAbility program. For example, AgrAbility programs have received support from the National Institute for Occupational Safety and Health and the Kellogg Foundation, as well as from University Biological and Agricultural Engineering Departments.

Mr. Latham. The Department of Agriculture has been working over the last few years to meet the needs of underserved farmers. I understand the needs of farmers with disabilities were identified in both the small farm and minority farmer discussions at USDA. To my knowledge, the AgrAbility program is USDA's only outreach to this significant population. Is the Department serving this population completely or is there room to expand AgrAbility to address these needs?

Response. The AgrAbility program is managed as a competitive grants program. There are currently 18 states receiving grants under the AgrAbility program. No new state projects will be added in fiscal year 2000. The Small Farm Commission Report encourages the Secretary to give consideration to recommendations regarding the need to support farmers with disabilities. The National Easter Seal Society--NESS--has suggested that USDA expand the AgrAbility Program and establish a Center on Disability in Agriculture. The NESS suggestion was not received in time for full review by the Commission.

While the AgrAbility program has provided exceptional support for people with disabilities in agriculture through on-farm assessments, peer counseling, and education of professionals on accommodating disability in agriculture, the effectiveness of the program is limited by two factors.

The first factor is a lack of financial resources for small and limited resource farmers to pay for the necessary accommodations identified through the AgrAbility Program. The AgrAbility state projects work with State Vocational Rehabilitation services, foundations, and other agencies to help find financial resources to pay for the necessary accommodations. We are also planning a USDA millennium event in conjunction with the National AgrAbility workshop this fall for the Farm Service Agency and the Natural Resources Conservation Service state personnel to increase their awareness and ability to serve farmers and ranchers with disabilities. These two USDA agencies and CSREES administer the majority of programs providing direct assistance to farmers and ranchers.

The second factor is a lack of research on innovative cost effective methods of accommodating disability in the agricultural production workplace.

The AgrAbility program does not have a research complement to ensure that basic research advancements in medical rehabilitation, engineering, technology, and agricultural sciences are applied to accommodating the agricultural workplace for farmers and ranchers with disabilities. While many universities have the expertise to conduct this needed research through their colleges of medicine, engineering, and agriculture, this research will not be conducted without dedicated funds.

QUESTIONS SUBMITTED BY MR. LATHAM

Mr. Latham: Do you have materials in the NPGS that are at risk for loss and that will remain at risk under the Administration's budget proposal?

Response: Duplicate germplasm samples and duplicate copies of databases maintained in at least two physically-separate locations represent perhaps the most effective safeguards against the risk of catastrophic loss from weather-related causes, other natural phenomena, equipment failure, and human activity, be it intentional or unintentional.

The Germplasm Resources Information Network (GRIN) in Beltsville, MD, which maintains key data associated with NPGS germplasm, is duplicated by mirroring, i.e., there are two copies of the database on disk. One weekly duplicate copy of the database is maintained off-site locally on tape and one duplicate is sent monthly to National Seed Storage Laboratory, (NSSL), Ft. Collins, CO. The Congress in fiscal year 2000 allocated $250,000 to the Beltsville, MD location that enabled additional data safeguards, such as incorporating into GRIN evaluation and characterization data that are still on local databases, and continual hardware and software upgrades to help safeguard database integrity.

At present, ca. 74,800 (ca. 19% of total) seed samples and 29,600 (ca. 93% of total) clonally-propagated samples in the NPGS are not duplicated, and consequently are at a higher risk of catastrophic loss than are the duplicated samples. Some of the samples that are not duplicated within the NPGS are duplicated in other nations (e.g., the NPGS pineapple collection is duplicated in Martinique) or at International Agricultural Research Centers (IARCs). But, with increasing fiscal shortfalls at other institutions, the NPGS cannot assume that duplicates of "lost" germplasm can be readily obtained elsewhere.

As the preceding data indicate, the risk is greatest for clonally-propagated germplasm. With many clonal crops, long-term "backup" methods (e.g., cryopreservation) do not exist; more funds are needed for NPGS researchers to develop this technology. The President's budget request does include funds for intensifying research on developing methods for preserving clonally-propagated germplasm with cryopreservation or in vitro technology. The budget also includes funds for improving the rate at which clonally-propagated germplasm is backed up in orchard plantings.

Germplasm may also be at risk from slower, more insidious processes such as gradual loss of viability, loss of genetic integrity, infectious disease, etc., that deteriorate the quality of germplasm and associated data. The following list illustrates some NPGS germplasm potentially at risk:

1) Griffin, GA: At least 15% (12,300 + accessions) of the seed samples at Griffin are greater than 20 years old, or are original seed lots with few seeds. With the few funds available for operations (ca. 6% of total FY 1999 budget), relatively few accessions can be regenerated at present. There are about 1,000 clonal samples that are not duplicated.

2) Geneva, NY: About 20-25% (ca. 4,000 accessions) of the seed-propagated germplasm accessions are at risk because of low or unknown viability, or low seed numbers. With the few funds available for operations, relatively few accessions can be regenerated at present.

3) Mayaguez, PR: Without additional funds for clonal propagation and virus eradication, 30% of the plantain and banana clones at this site may die of virus infection.

4) Ft. Collins, CO: More than 20% (ca. 66,000) of the duplicate seed accessions in long-term storage at NSSL have not been tested recently for their viability, and consequently may be at risk. Some of these have too few seeds to test with current technology; for others, no funds are available to hire more technical staff to conduct germination tests.

5) Brownwood, TX: Approximately 60% of the pecan accessions there are represented by only one tree, and none of the accessions are backed-up at another site. No funds are currently available to improve this situation.

6) Ames, IA: Approximately 30% of the total of 46,300 accessions have low seed number and/or low germination percentages that put them at risk. There are either no funds to regenerate them, or none for applied research to develop standard regeneration and seed quality assessment protocols for some accessions.

7) Corvallis, OR: Under the Administration's current budget request, $27,000 of the base funding for the Corvallis genebank will be eliminated. Those funds support the hop (a key ingredient for brewing) germplasm maintenance, regeneration, and viral eradication program. If the preceding funds are not reinstated, this site will be unable to maintain and distribute the collection in pathogen-negative (virus, fungus, and bacteria-free) status.

8) Davis, CA: Essentially none of the clonal fruit and nut (grape, cherry, walnut) germplasm at this site is backed up, primarily because of lack of funding.

9) Riverside, CA: Essentially none of the citrus germplasm at this site is backed up, primarily because of quarantine restrictions related to exchange of germplasm with unknown disease status, and lack of funds to conduct research on developing protocols for preserving citrus seeds long-term.

Mr. Latham: With current resources, are you able to manage the materials that are in the quarantine centers in a manner that fulfills the demands of the users? Have materials died in quarantine centers? Are the materials made available to the requestors in a timely manner?

Response: a) In general, the Plant Germplasm Quarantine Office/National Plant Germplasm Quarantine Center (PGQO) in Beltsville, MD can manage the plant germplasm in quarantine successfully, provided the amount of germplasm in the PGQO does not exceed current capacity, which is determined primarily by the funding available for personnel, operations, and facilities. To ensure that its capacity is not exceeded by demand, the PGQO is establishing annual quotas for each type of germplasm. These were communicated to germplasm users in May 1999 and put into effect for fiscal year 2000. The quotas will vary somewhat over years based on factors such as the germplasm in the quarantine testing "pipeline" at the beginning of the year, changes in testing protocols, and changes in program goals.

b) No significant germplasm losses have occurred in the potato, sweet potato, rice, or sugarcane held by the PGQO. In the past, fruit tree accessions in the PGQO orchards were lost because of inadequate care, and insufficient attention to matching the work load with the resources available to tend to this germplasm. These problems were addressed and loss has been minimal during the recent years of orchard testing.

Some replicates of accessions have been lost to herbicide injury but, in these cases, a sufficient amount of backup material was available to repeat the tests as necessary. Occasionally, replicate samples of blackberry, raspberry, or currant perish from winter damage in the screenhouses. But,

these samples are "backed up" so the accession is not lost, but its release from quarantine is delayed because the tests must be repeated. Losses from winter kill have been minor during recent years because of mild weather, and improved horticultural care. Sweet potatoes, Irish potatoes, and currants are backed-up in tissue culture for additional security.

The stone fruit (cherry, peach) quarantine program is conducted entirely in greenhouses and screenhouses, where germplasm loss is relatively rare, but does occur occasionally because of several factors that are not unique to PGQO: 1) the inherent difficulty of maintaining trees in pots for years; and, 2) cherry and peach accessions received by PGQO as budwood are often difficult to propagate, especially after days in international transit, and may die before they are established.

c) Germplasm is made available ("released") from quarantine as rapidly as quarantine regulations and/or "pathogen clean up" permit. The only crop with a backlog of accessions awaiting quarantine testing is rice, with a 4,000 accession backlog. The rice backlog can be addressed if the testing protocol is revised to continue quarantine testing at Beltsville with seed production of quarantined accessions in North Carolina (where rice is no longer grown commercially). The feasibility of this arrangement will be tested in FY 2000. For other crops, the release/backlog situation is summarized below:

1) Pome fruits (apples, pears, quince) are now released "provisionally" within one year if the first round of testing is negative and if the propagative material is available. Under the "provisional release policy," germplasm users can propagate and evaluate the germplasm prior to its final release from quarantine. This policy has been very popular with germplasm users, and is feasible because of the PCR test for phytoplasmas. Final release still requires at least 3-5 years because test trees must produce fruit for evaluation of symptoms: there is no technological substitute for the fruit evaluation.

2) Stone fruits (cherry, peach) are also provisionally released after one year, but full release requires at least 3-5 years for germplasm imported as budwood. But germplasm imported as seed can be released sooner (12-18 months) because less testing is required.

3) Sugarcane imported from other nations requires 18-24 months in quarantine, whereas sugarcane shipped interstate (e.g, Louisiana to Florida) requires 12-18 months. Current molecular technology will probably not accelerate the release time, although the former may improve the accuracy of test results.

4) Rice cannot be released from quarantine until it sets seed, which can require 100 to 240 days, depending on the specific germplasm. Notably, quarantine testing could be conducted entirely from <u>in vitro</u> tissue culture and germplasm released in 30 days but, because it would be distributed in the form of tissue-cultured plantlets rather than true seed, the user community has not been interested in this method.

5) The quarantine process for potatoes and sweet potatoes require 18-24 months; tests require one year and are repeated. The testing required for true potato seed is substantially less than for potato tubers.

6) The quarantine process for currants and gooseberries requires 3-5 years, necessitated by waiting for plants to fruit so they can be evaluated for the reversion virus. There is a PCR-based test for the reversion virus but APHIS has not accepted it, although Agriculture Canada has done so. The PCR test could enable provisional release after one year, if the propagative material

is available.

7) The quarantine process for raspberries requires about 3 years.

Mr. Latham: With current resources, are you able to take advantage of modern molecular techniques to accelerate the rate of quarantine testing for crops such as rice, apples, cherries, sweet potatoes, and others?

Response: Molecular diagnostic techniques alone may not accelerate the final release of germplasm from quarantine but they may accelerate the provisional release of germplasm, as described above for pome and stone fruits. The tests will detect target pathogens that have been thoroughly characterized genetically, but not other "exotic" pathogens which are often essentially unknown scientifically, except for symptoms on the plant or fruit. Thus, molecular diagnostic tests will not completely replace the time-consuming visual observations of plants currently required by APHIS regulations. Consequently, the speed of the entire quarantine process may be more closely related to principles of scientific risk assessment and/or the field and greenhouse capacity, rather than to modern molecular technology.

Despite the preceding factors, the current resources at the Plant Germplasm Quarantine Office (PGQO) do not enable the staff to take full advantage of molecular diagnostic techniques. Additional resources in the form of a senior technical assistant and additional supplies could hasten the implementation of molecular technology which would facilitate provisional germplasm releases. Additional resources are needed to hire additional technical staff to fully utilize the new greenhouse and screenhouse space at the PGQO, and accelerate the rate whereby germplasm can be released from quarantine.

1) Pome (apple, pear) and stone fruits (cherry, plum, peach): The polymerase chain reaction (PCR)-based test for phytoplasmas and molecular hybridization assays for viroids have enabled provisional quarantine release within one year, providing adequate budwood is available. Half-time technical assistance is needed to fully utilize new greenhouse and screenhouse space, implement more fully this molecular testing program, and further accelerate the quarantine process.

2) Stone fruits: Implementation of a PCR-based test for sharka (plum pox) could supplement the plant graft testing on indicator species, but would require additional resources for implementation, and half-time technical assistance to fully utilize new greenhouse and screenhouse space.

3) Sugarcane: Current quarantine testing relies on observations of symptoms on greenhouse-grown plants, which is not ideal for sugarcane. Molecular tests for Fiji virus (Oceania) and sugarcane mosaic gemini virus (Africa) are under development at PGQO. Implementing these tests, which might result in provisional quarantine release, will require additional resources for the PGQO.

4) Rice: Molecular techniques are not required to accelerate pathogen diagnostic testing with rice, because the key pathogens are readily culturable bacteria. Half-time technical assistance is needed to fully utilize new greenhouse and screenhouse space for the rice quarantine program, should the North Carolina seed production option prove infeasible.

5) Currants and gooseberries: A PCR-based assay for the reversion virus in these plants should be implemented, but this will require APHIS approval and additional resources for PGQO.

6) Potatoes and sweet potatoes: A PCR-based test for phytoplama should be

implemented to improve the accuracy and reliability of the potato/sweet potato pathogen detection, but would not necessarily accelerate the rate whereby germplasm is released from quarantine. Half-time technical assistance is needed to fully utilize new greenhouse and screenhouse space and to bolster this molecular testing program.

Mr. Latham: Have the germplasm materials at the Griffin, Georgia, and Pullman, Washington, facilities been tested for viability?

Response: 32% of the 68,990 germplasm accessions at Pullman, WA have undergone germination testing at Pullman during the 10-year period of 1991-2000. Most of the germination tests were conducted during the last 6 years (1995-2000).

During the last 10 years, 339 (.042%) of the more than 79,000 seed-propagated accessions at Griffin, GA have undergone germination testing. There are 686 clonally-propagated sweet potato accessions at Griffin that are regularly checked visually for health and vigor.

Duplicate samples of 77% of the seed-propagated accessions from Griffin and 85% of the accessions from Pullman have been deposited at the National Seed Storage Laboratory, Ft. Collins, CO. The viabilities of many, but not all, of these duplicate samples were tested by NSSL before being deposited in long-term storage and the germination information made available to curators at Griffin and Pullman.

Mr. Latham: What percentage of the NPGS collection requires timely regeneration to maintain its genetic integrity?

Response: In our response, we assume that 1) "timely" means "during the next 2-5 years" (consistent with the 1997 GAO study of the NPGS), and 2) "regeneration" is relevant for the 400,000 + seed-propagated NPGS germplasm accessions. Because of the variable quality and quantity of data available, the accuracy and precision of the following percentages vary. Across the NPGS, the median percentage of collections that require regeneration during the next 2-5 years seems to be about 30%. The percentage information is provided for the record.

[The information follows:]

Selected NPGS collections	Estimated percentage requiring regeneration during the next 2-5 years
Tomato genetic stock (Davis)	20-50%
Soybean (Urbana)	55%
Cotton (College Station)	50-60%
Seed-propagated fruits and nuts (Corvallis)	50%
Seed propagated accessions (Ames)	20%
Seed propagated accessions (Griffin)	31%
Seed propagated accessions (Geneva)	2-97%
Small grains (Aberdeen)	8-9%
Seed propagated accessions (Mayaguez)	10-50%
Seed propagated accessions (Pullman)	3%
National Seed Storage Laboratory (Ft. Collins)	30%

Mr. Latham: With current resources, and at the current rate of regenerating accessions, how long would it take ARS to regenerate those accessions?

Response: Regeneration rate is determined not only by fiscal resources available for that activity, but also strongly by the biological properties of each crop (breeding system, genetic constitution, growth rate, duration,

etc.). Therefore, information for representative individual seed-propagated crops is presented. Because of the variable quality and quantity of data available, the accuracy and precision of the following figures vary. Across the NPGS, the median period required to regenerate these accessions seems to be more or less 9 years. But, importantly, for a substantial proportion of these accessions, especially of wild species (e.g., tomato, potato), research and development will be required to first develop methods for successful regeneration. The estimated years required to regenerate accessions is provided for the record.

[The information follows:]

Selected NPGS collections	Estimated years required to regenerate accessions
Tomato genetic stock (Davis)	3-7 years
Soybean (Urbana)	5 years
Cotton (College Station)	10-15 years
Seed-propagated accessions (Corvallis)	No resources are currently available for regenerating those accessions
Seed propagated accessions (Ames)	2-23 years
Seed propagated accessions (Griffin)	12-15 years
Seed propagated accessions (Geneva)	1-25 years
Small grains (Aberdeen)	5-10 years
Seed propagated accessions (Mayaguez)	10 years
Seed propagated accessions (Pullman)	7-10 years
National Seed Storage Laboratory (Ft. Collins)	Regeneration of base collection is conducted at active sites.

Mr. Latham: What percentage of NPGS germplasm is not in long-term, backup storage?

Response: At present, ca. 74,800 (ca. 19% of total) seed samples and 29,600 (ca..93% of total) clonally-propagated samples in the NPGS are not in long-term, backup storage at the National Seed Storage Laboratory, Ft. Collins, CO. For some crops, such as citrus and some tropical fruits (managed at Riverside, CA; Hilo, HI; and, Miami, FL), essentially none of the collection is backed up at NSSL because of lack of funds to conduct research on developing practical and effective seed storage and clonal cryopreservation/tissue-culture protocol.

Some of the samples that are not duplicated within the NPGS are duplicated in non-NPGS germplasm collections in the U. S., or in collections in other nations (as may be the case with some citrus germplasm), or at International Agricultural Research Centers (IARCs). But, with budgetary cuts at universities, the IARCs and in developing nations, and the increasing complications to international germplasm exchange associated with the Convention for Biological Diversity and other international germplasm legislation, the NPGS cannot assume that specific germplasm samples can always be secured on demand from international sources.

Mr. Latham: If we lose germplasm due to the lack of regeneration, is it always possible to replace it?

Response: No, it is not always possible to replace germplasm samples that are lost due to lack of regeneration when they are not duplicated within the NPGS, obtainable from other germplasm collections or genebanks within the U.S. or internationally, currently grown by farmers or produced by seed companies or nurseries, or if they are extinct in nature, as is the case with some wild species. Some of the genetic components of the "lost samples" may

be conserved in other, genetically closely-related samples. But the degree of genetic redundancy between such samples may be quite variable and unpredictable. Consequently, germplasm managers in general do not assume that genetically closely-related samples necessarily contain precisely the same genetic components of the "lost samples," some of which may be key to current and future genetic improvement of crops.

Mr. Latham: What is the status of international efforts to exchange germplasm and is any germplasm located outside of the U.S. at a risk of loss?

Response: During the last decade-especially during the last five years-developments in international and national legislation and diplomatic agreements have complicated, or sometimes precluded, free international exchange of germplasm. Part of this trend is the result of the philosophical change from considering germplasm the "common heritage of humankind," to formal recognition in the Convention on Biological Diversity (1992) of nations' sovereignty over the germplasm within their own borders. The CBD and other legislation now require that "prior informed consent," and arrangements for "benefit sharing" be established before germplasm can be exchanged. Although such provisions are considered by some as the basis for durable germplasm conservation and exchange, to some extent, they have slowed the rate of germplasm exchange, and sometimes impeded the ability of scientists to visit endangered locales and at least perform a "triage" to save crop germplasm. Negotiations that precede plant exchange are now considerably longer, more complicated, and consequently more expensive than ever before.

Outside of the United States, destruction of natural and agricultural habitat and of traditional cultures is proceeding at an accelerated rate that threatens germplasm. Although other nations (especially in the developing world) have established genebanks and reserves for natural vegetation, on a global scale, the capacity to manage germplasm in gene banks or in reserves has probably not increased substantially. At present, many genebanks in other nations have very limited capacity, and conservation reserves are often not adequately managed. Also, on a global scale, enhanced capacity in some nations (e.g., several developing nations) has been "canceled out" by lost capacity in other nations (e.g., Russia, some nations of the Former Soviet Union), by cutbacks in funding to some of the CGIAR centers, etc. Consequently, germplasm outside of the U.S. is still at risk. As limited resources permit, staff of the NPGS are working with officials in Russia and elsewhere to place duplicate germplasm samples in the NPGS for safekeeping.

Finally, economic "globalization" has benefitted many worldwide through substantial expansion in international trade, and development of transportation infrastructure (e.g., roads, airfields, navigational channels) affording ever easier access to previously remote regions that may facilitate germplasm collection, tourism, agricultural development, etc. But, this access has also increased the danger to germplasm in nature, as formerly pristine regions are converted from traditional agriculture and/or natural habitats to more intensive agricultural and forestry practices. Concurrently, the traditional cultures of indigenous peoples, and their rich lore about plant uses, may be lost. Lastly, penetration into pristine regions provides invasion routes for additional exotic, invasive species which may rapidly deteriorate the landscape and endanger potentially valuable germplasm of traditional crops and their wild relatives.

Mr. Latham: What percentage of accessions is unavailable for distribution? Why are they unavailable?

Response: For the NPGS as a whole, approximately 18% of the nearly 439,000 total accessions is unavailable for distribution. Notably, the percentage of

accessions unavailable varies widely across the different crops and sites of the NPGS (see table below). For example, more than 99% of the pecan accessions at the Brownwood/College Station site are available for distribution, whereas in contrast nearly all citrus accessions are not currently available.

For the most part, the accessions are unavailable because they consist of too few seeds or plants, and/or because of uncertain viability and disease status. Lack of personnel and operating funds for standard seed and clonal increases, for special propagation techniques (e.g., tissue culture), and insufficient field and greenhouse space are the most common causes for such unavailability. Many of the unavailable accessions are wild species; they often require scarce greenhouse space for seed increase, prohibitively expensive special techniques for propagation, or funds for research to develop such techniques.

Some discussion of certain figures listed below is warranted. The unavailable maize genetic stocks in Urbana are primarily newly received materials, many from NSF-funded plant genome projects, that require seed increase before sufficient quantities are available for distribution to users. The many unavailable citrus accessions are largely result from their uncertain disease status; quarantine restrictions for citrus are manifold. Transport of citrus across state lines is highly regulated, and until funds are available for disease indexing, most of the accessions cannot be transported to researchers in Florida, Texas, etc. In crops other than citrus, quarantine restrictions also contribute to germplasm being unavailable for distribution. The percentage of accessions unavailable for regeneration is provided for the record.

[The information follows:]

Selected NPGS sites	% unavailable accessions
Brownwood/College Station, TX (pecan)	>1%
Davis, CA (tomato)	3.5%
Sturgeon Bay/Madison, WI (potatoes)	5%
Hilo, HI (tropical fruits)	5%
Aberdeen, ID (small grains)	7.4%
Pullman, WA (plant introduction station)	10%
Griffin, GA (plant introduction station)	15.5%
Davis, CA (fruit and nut, clonal)	22%
Geneva, NY (plant introduction station)	28%
Urbana, IL (maize genetic stock)	ca. 40%
Riverside, CA (citrus)	ca. 95%

Mr. Latham: What percentage of the NPGS budget is spent on maintenance and regeneration?

Response: Of the total $26.7 million currently allocated to the NPGS about 63% ($16.9 million) is devoted to germplasm conservation and preservation, which includes the activities of maintenance and regeneration. The remainder of the NPGS budget is allocated to germplasm acquisition, characterization, and evaluation. At specific NPGS sites (e.g., plant introduction stations, crop-specific collections of clonal germplasm, grains, oilseeds, etc.) that both maintain and regenerate germplasm, the budgetary percentage devoted to maintenance and regeneration may be 75% or higher.

Mr. Latham: If there is not an increase in the NPGS budget as ARS requested for FY 2001, what are some of the forecast ramifications?

Response: The ramifications of a static NPGS budget for fiscal years 2001-2005 can be forecast from both a fiscal and a programmatic standpoint. From a

fiscal standpoint, consider the current budget of $26.7 million, and assume the following: 1) inflation reduces purchasing power at a rate of 2.6% per year (the mean calculated from annual estimates for this period in the fiscal year 2001 Budget Analytical Perspectives); and 2) personnel costs increase by 3.4% per year (the mean calculated from annual estimates for this period in the fiscal year 2001 Budget Analytical Perspectives). Given the preceding figures, and a static budget during fiscal years 2001-2005, the purchasing power of the NPGS budget would decrease by 14% from inflation. During the same period, the current percentage (15%) of the NPGS budget devoted to non-salary items (equipment, operations, travel) would decrease by 18% to 13%. Adjusted for inflation, the non-salary budget would effectively be reduced to less than 10% of the total NPGS budget. And, at certain NPGS sites, that percentage would be substantially less than 10%.

A static budget during fiscal years 2001-2005 would have severe programmatic ramifications throughout the NPGS. The budgets of some sites are already running deficits that are accompanied by substantial programmatic effects. For example, the clonal site for pecan germplasm lacks funds for applying fertilizer to orchard plantings this year. Funding at many sites would be insufficient not only for salaries of temporary employees, but also of some permanent curatorial staff. At many sites, no funds would be available for utilities, travel, operations, facility repairs or expansion, supplies, or equipment. Position vacancies would be abolished to provide funds for operations.

With a static budget during fiscal years 2001-2005, the NPGS would by necessity focus nearly exclusively on providing security for databases and for germplasm stored in coldrooms, greenhouses, and field plantings. Purchase of equipment key for germplasm security, e.g., an electrical generator for back-up power for coldrooms at Mayagüez, PR, might be precluded. Acquisition of endangered germplasm would slow or cease, as would evaluation of germplasm for agronomically or horticulturally valuable traits. The rate of duplicating (backing-up) germplasm and testing it for health, viability, or genetic integrity would slow or cease. Germplasm would move through the quarantine process more slowly, or not at all. Germplasm currently at risk would perhaps be endangered further, whereas additional germplasm might also be endangered. Also, little or no funds would be available for germplasm evaluation, an activity that the 1997 GAO study indicated was a high future priority for the NPGS. As the funds available for maintaining each accession shrank, the supply of germplasm would shrink, which would limit germplasm distribution, and impede the progress of important research and breeding programs. Should additional funds become available in later years, they would initially be devoted to restoring the NPGS to its state in fiscal year 2001, rather than to progress on new initiatives.

A static budget would preclude the NPGS from exploiting the new tools of genomics and biotechnology to develop more effective and efficient means of maintaining and regenerating germplasm. The ramifications would be especially severe for clonally-propagated crops, many of which cannot now be preserved by long-term tissue culture or cryopreservation.

Lastly, there is currently more demand (more frequent requests, and more samples per request) from scientists for germplasm for research, and more public interest in conserving genetic diversity and in exploiting it for crop improvement, than at anytime in the past. For example, soybean farmers through the United Soybean Board and state checkoffs have been and still are investing millions to exploit soybean germplasm. Researchers are already finding new genes for improved levels of disease resistance and yield. Genomic technology is identifying loci and allelic variants important for yield, seed composition, disease resistance and other economically important

traits in soybean, tomato, and other crops. The major funding increases for plant genomic research at NSF will generate many new specialized genetic stocks for the NPGS to manage. For example, NSF-funded research will generate at least 50,000 new maize (corn) genetic stocks, which would more than double the size of the NPGS maize stock center. Just when researchers can use germplasm more effectively and efficiently than ever before, just when its clientele is demanding more from the NPGS, and just when the NPGS, if sufficiently funded, could deliver more than ever before to its customers, the NPGS would struggle just to maintain staff, facilities, and germplasm.

Mr. Latham: If NPGS received a funding increase for FY 2001, what would you be able to accomplish with the additional resources?

Response: The magnitude of the funding increase to the NPGS would determine what could be accomplished. To answer this query comprehensively, we will consider funding increases of 5%, 50%, and 100% for fiscal year 2001.

1) 5% increase: An NPGS-wide 5% funding increase would equal $1.337 million. This would have little effect, other than partially defraying annual losses to the NPGS operating budget due to erosions in purchasing power (Consumer Price Index = 2.4% for 2001) and the effects of Federal pay raises (estimated at 3.7% for fiscal year 2001). Nonetheless, it would not completely counteract the negative impacts of the latter two fiscal forces. At some sites that are fiscally healthier than others, it might permit minimal increases in general operations, such as testing the germinability of 200 rather than 100 accessions.

2) 50% increase: An NPGS-wide 50% funding increase would equal $13.37 million. Such an increase would enable hiring of additional technical, database, and scientific support staff needed for expanding the NPGS-wide program of general germplasm maintenance, thus decreasing backlogs in data to be entered onto databases, and increasing the number of accessions available for distribution (e.g., more disease testing so that more materials--especially clonal--would be available). Additional staff could also conduct more genetic analyses, germination testing, and agronomic or horticultural evaluations. With additional staff to expand operations, additional supplies, equipment, and other operational items would be purchased. Some additional germplasm could be acquired, and applied research on regenerating difficult accessions (often, wild species) would be conducted. Some priority facilities (e.g., additional greenhouses) could be constructed. As a result, the time needed to regenerate accessions that are endangered because of low seed number or viability would be shortened somewhat, thus safeguarding some of the germplasm currently at risk.

3) 100% increase: An NPGS-wide 100% funding increase would equal $26.7 million. Such an increase would enable the NPGS as a whole to accelerate substantially its progress in all facets of plant genetic resource management. As a result, the time needed to regenerate accessions that are endangered because of low seed number or viability would be shortened dramatically, thus safeguarding much of the germplasm currently at risk. An additional 12-13 scientists in total would be hired. The number of permanent, full-time technicians, information management personnel, or support scientists would be increased by about 80, which would almost double the current total in the NPGS. At sites that employ substantial crews of part-time or seasonal workers, almost double the number of these workers would be hired.

Ever more germplasm would be safeguarded by newly developed cryopreservation and in vitro culture technologies. The genetic diversity in entire collections could be characterized by new, high throughput methods for assessing genetic diversity. Funds would be available to adapt the latest

technology of genomics and bioinformatics to germplasm management by hiring scientists trained in genome analyses, bioinformaticists and computational biologists. New, specialized databases would be constructed to meet specific user needs. Some genebanks would have the resources to begin to distribute germplasm in the form of isolated, purified DNA for molecular studies.

And, costly new specialized facilities, e.g., specialized greenhouses, screenhouses, growth chambers, and laboratories, could be constructed. New greenhouses and screenhouses are needed throughout the NPGS, especially if new funding were available to intensify germplasm regeneration, maintenance, and quarantine programs. With crops that are cultivated worldwide, the genetic variability and ecological adaptation within the crop are so broad that no one site is suitable for cultivating all varieties in the field, so some must be grown in greenhouses. Furthermore, until in vitro culture techniques are developed for particular clonally-propagated germplasm, greenhouses and screenhouses can serve as back-up sites for accessions that are now maintained solely in orchards at other sites.

Mr. Latham: Does the NPGS have sufficient resources to handle the projected increase in specialized genetic stocks generated by the publicly funded plant genome programs?

Response: During the next decade, the specialized genetic stocks and research tools produced by NSF and USDA/NRI supported public plant genome projects will substantially increase the size of the NPGS's specialized genetic stock collections. If the funding currently available for supporting these stock collections does not increase proportionately, then resources will not be sufficient for optimally conserving and distributing these valuable research tools.

For example, managers of pea, common bean, and lettuce genetic resources are being asked to curate numerous special genetic stocks developed for gene mapping and characterization projects supported primarily by the NRI, but the personnel, equipment, and facilities currently are insufficient to do so. Likewise, additional scientific support staff and another scientist would be needed for the small grains genetic stock collection to manage a substantial number of new genetic lines. Current funding and facilities devoted to tomato and potato genetic stocks would need to be expanded extensively to handle thousands of new genetic stocks that may be generated by tomato or potato genome projects.

Genome projects will increase the numbers of maize (corn) genetic stocks enormously. One large maize genome project funded by NSF in 1999 is generating ca. 50,000 new genetic lines. As a result, the maize genetic stock collection will require at least one additional technician and accompanying increased budget for operations (e.g., additional field space costs, supplies, summer hourly help) to manage those lines alone. New personal computers must be purchased for the new staff, and upgraded periodically. As the stocks arrive during the next few years, additional climate-controlled seed storage space must be available, which may require construction. New greenhouses are needed for cultivating some of the new stocks safely. Thus, the impact of this one project on the NPGS will be on the order of $50,000-$75,000 annually, adjusted upward for inflation, for the foreseeable future. And that quantity reflects only increased operational costs: capital improvements (greenhouse, cold storage space) would further increase the total cost. The current ARS base budget for the maize genetic stock collection does not suffice even for handling the new genetic stocks generated just by that one (albeit large) project. It is uncertain how many more such projects will be funded by NSF or NRI in the future, but each has the potential of increasing the demand on the NPGS's resources by a similar amount.

RESEARCH, EDUCATION, AND EXTENSION MISSION AREA

QUESTIONS SUBMITTED BY MS. EMERSON

KYOTO AND GLOBAL CHANGE RESEARCH

Ms. Emerson: This year's budget request proposes a $32 million increase in the Global Change Research Program and an $8 million increase in the Climate Change Technology Initiative. That is a 60 percent and 50 percent increase respectively. These are some of the most dramatic increases proposed in the budget request and suggest that this is one of USDA's top research priorities. I understand that some of this research is for the development of bio-based fuels, which I would support, but I question the value of other aspects of this research to America's farmers and ranchers, who face a lot of challenges right now as we enter the third straight year of low commodity prices. Do you believe this kind of global warming research ought to be one of our highest priorities right now? It just seems to me that with the financial hardship out on the farm that USDA ought to be focusing on its core research responsibilities.

Response: We strongly believe that global change research should be a top Departmental priority. We also believe that the key features of our program, such as improving biomass conversion and understanding the role of soil carbon, are our core research responsibilities. As you point out, there is no doubt that the farm economy is currently struggling, and we need to maintain a sound program of research and financial assistance to help producers deal with this economic downturn. However, we believe that greenhouse gas emissions may create both risks and economic opportunities for production agriculture and private woodlot owners that could have significant consequences for their incomes over time. If we fail to undertake adequate research, we will not fully understand how crops, trees, livestock, pests, and ecosystems will respond to higher levels of greenhouse gasses in the atmosphere; we will fail to understand cost-effective ways to make agriculture and forests more adaptable to any changes in climate and weather, should they occur; we will fail to understand the carbon cycle and the possibilities for farmers and foresters to sequester carbon; and we will fail to have the measuring, verification and monitoring mechanisms in place that would facilitate greenhouse gas emitters purchasing carbon-sequestering activities from farmers and foresters.

While there have been some disagreements among the scientific community regarding the seriousness of the impacts global warming may have, the potential effects on agriculture need to be addressed now, so that adaptation strategies are made available should climate change. For example, weather patterns and climatic regions of the U.S. could shift, changing the capacity for certain regions of the country to produce crops. U.S. agriculture must be prepared to deal with potential changes in order to maintain production capacity, by utilizing crops that have been adapted to the changing climate, and by adopting alternative production practices. Global climate change could present enormous risks for U.S. farmers and woodlot owners, and indeed the world, if they are not prepared to mitigate the effects of climate change and respond to it in order to maintain the quantity, quality and safety of the food supply. Global Change research may also help farmers respond to problems with pest and disease control, invasive species control and eradication, and other areas which could become more prevalent in different areas where they did not exist before. In addition, our research program is aimed at helping farmers capitalize on potential climate change risks by creating opportunities to sequester carbon through farming activities.

USDA's research program also fulfills the requirements of the Global Climate Change Prevention Act of 1990. This Act, which was part of the 1990 Farm Bill, called for the Secretary to conduct research to study the effects of climate change on agriculture and forestry, research to understand and

mitigate the adverse effects on crops, and study forest emissions and mitigation of negative effects on climate change.

The $32 million increase for the Department's Global Change Research Program includes the ARS funding for Alternatives to Methyl Bromide, which is scheduled to be phased out in 2005. This research program is one of the highest priority areas for the ARS. Also included are funds to support the USDA portion of the Government-wide UV-B monitoring network, to establish ground-based data on UV-B radiation reaching the Earth's surface. It is anticipated that the 2001 increase in the National Research Initiative will support an additional $5.5 million above the $6.4 million currently estimated for FY 2000 for global change research projects. A $12 million increase is requested for NRCS to develop a soil carbon database. Without such data, it may not be possible to measure how farmers' carbon sequestration activities reduce overall greenhouse gas emissions. This work will be essential to ensuring economic opportunities for sequestering are created. Increases are requested for the Economic Research Service to study the economics of carbon sequestration. The ARS research budget includes increases above the 2000 level of $4.7 million for carbon cycle research; $0.4 million for Alaska agro-ecosystems; and $2 million for research to mitigate the effect of climate change impacts on food availability. Under the Climate Change Technology Initiative, our budget request also includes a $14 million increase for ARS and the Forest Service to study conversion of biomass to energy. Again, such research can open the door to new economic opportunities for farmers to produce biomass crops that will substitute for imported oil and help the environment. In addition, a request for additional funding for the national assessment organized by the U.S. Global Change Research Program is included in the ARS budget. The first in a series of national assessments of global change impacts will be provided for public comment this summer. We would be pleased to provide to the Subcommittee copies of the preliminary draft report, which includes impacts on agriculture and forestry, as soon as it is available.

GLOBAL CHANGE FUNDING

Ms. Emerson: Would you outline for the Subcommittee how much of the GCRP and CCTI dollars would go to the four agencies in the USDA research mission area?

Response: Of the $31.6 million in total funding increases requested for USDA under the GCRP, $16.3 million would support work under the auspices of the REE Mission Area. The GCRP funding increases are split as follows:

- An increase of $1.6 million for ARS Methyl Bromide alternatives research;
- An increase of $7.9 million for ARS research on carbon cycle, mitigation of climate impacts on food availability, Alaskan agro-ecosystems studies, and support for national assessment activities;
- An increase of $0.6 million for CSREES under the Special Research Grant for Global Change UV-B Monitoring;
- An increase of $5.5 million under the CSREES National Research Initiative; and,
- An increase of $0.7 million for the ERS study on economics of carbon sequestration.

Of the increase of $24 million requested by the Department for CCTI, $8.5 million is for ARS, including $4.5 million for biomass research.

Ms. Emerson: Would you provide for the Subcommittee a table showing how much money these four agencies have spent on the initiatives since their inception?

Response: While the GCRP has been an ongoing research initiative, the CCTI is a new initiative. Therefore, no agency funds have been spent thus far on CCTI. The FY 2001 funding would initiate this new focus area.

The Department began tracking the GCRP with the FY 1990 reporting. The National Agricultural Statistics Service does not participate in the GCRP. The funding amounts for the three participating Research, Education, and Economics Mission Area agencies are reflected in the following tables.

[The information follows:]

UNITED STATES DEPARTMENT OF AGRICULTURE
U.S. GLOBAL CHANGE RESEARCH PROGRAM
(Dollars in Millions)

Agency	1990	1991	1992	1993[1]	1994
ARS	$1.1	$5.1	$9.6	$17.4	$18.9
CSREES	4.3	9.4	11.4	11.2	12.3
ERS	0.0	0.0	0.8	0.8	0.8

(Dollars in Millions)

Agency	1995	1996	1997	1998	1999
ARS	$24.4	$25.4	$26.2	$26.7	$25.8
CSREES	9.9	9.6	12.2	7.4	7.4
ERS	0.8	0.8	0.8	0.8	0.8

(Dollars in Millions)

Agency	2000	2001
ARS	$26.7	$36.2
CSREES	7.4	13.5
ERS	0.8	1.5

Ms. Emerson: Were your budget requests for the GCRP and CCTI the agency's request to the Department, the Department's request to OMB, or were they perhaps OMB's numbers? Please provide for the hearing record a summary of what budget requests were made as the process went from the agencies to the Department to OMB.

Response: The USDA agencies collectively requested $93.5 million under the GCRP and $23 million to support CCTI in their agency requests to the Department. The following table reflects the 2001 history for the GCRP and CCTI through the budget development process.

[1]The Department began including Alternatives to Methyl Bromide research in the ARS GCRP estimates in 1993. The amount for methyl bromide that year was $7.4 million.

2001 FUNDING HISTORY
(Dollars in Millions)

Agency	2000 Current Estimate	2001 Agency Request	2001 Department Estimate	2001 Budget
GCRP:				
ARS	$26.7	$42.1	$36.2	$36.2
CSREES	7.4	13.5	13.5	13.5
ERS	0.8	1.5	1.5	1.5
NRCS	1.2	13.5	13.5	13.5
FS	16.9	22.9	22.9	19.9
Total	53.0	93.5	87.6	84.6

2001 FUNDING HISTORY
(Dollars in Millions)

Agency	2000 Current Estimate	2001 Agency Request	2001 Department Estimate	2001 Budget
CCTI:				
ARS	0.0	$14.0	$7.0	$8.5[2]
NRCS	0.0	3.0	3.0	3.0
FS	0.0	6.0	6.0	12.5[3]
Total	0.0	23.0	16.0	24.0

[2]Includes $4.5 million for biomass, and overlaps with Biobased Products/Bioenergy Initiative.

[3]Includes $9.5 million for biomass, which overlaps with Biobased Products/Bioenergy Initiative, and $3 million for carbon sequestration.

AGRICULTURE IN THE CLASSROOM

Ms. Emerson. Agriculture in the Classroom is a very important program operated by the Cooperative State Research, Education, and Extension Service. This program educates our young people about agriculture and helps them understand how farmers and ranchers provide food and fiber to the world. It's a program that gives flexibility to the states and volunteers who administer this program out in the country and who do a remarkable job of telling the story of American Agriculture. Would you describe for the Subcommittee some of the accomplishments of this program?

Response. The Agriculture in the Classroom program is an effective vehicle to provide students and educators with accurate information about food and agriculture. The program integrates scientifically-valid agricultural information into a variety of academic disciplines including science, the social sciences, language arts, and mathematics. The program reaches over 120,000 teachers annually, impacting over 5 million students.

In 1999, eight graduate-credit courses were offered throughout Missouri to better acquaint 200 teachers with agriculture and demonstrate how to integrate some facet of agriculture into the regular classroom curriculum. On average, each participating teacher will teach 10 years, reaching over 50,000 children. Efforts of this nature are being replicated across the Nation. For the 1999-2000 school year, the Missouri Farm Bureau Foundation for Agriculture is providing $7,500 in mini-grants to K-12 teachers who demonstrate ability to enhance student knowledge of agriculture. Thirty-nine classrooms will directly benefit from this endeavor. Mini-grant programs in each State and territory are supporting projects that promote agricultural literacy efforts.

Maryland's Agriculture in the Classroom program has been successful in educating teachers, students, and the public about agriculture with three Mobile Agriculture in the Classroom Laboratories. The themes for the mobile units are "Aquatic Science," "Agricultural Products," and the "Biotechnology and Food Safety."

Ms. Emerson. This program has been level-funded for many years at $208,000 and that has prevented USDA from really maximizing its potential. This year, the President has requested $476,000. Would you describe for the Subcommittee how funding shortfalls have really hampered the program in the past years?

Response. The capacity to address recent shifts in demographics, especially among Hispanic and Native American populations, has been limited. Funding shortfalls contribute to the lack of a program evaluation and inhibit teacher and curriculum development initiatives. Outreach activities have been scaled back, and popular, high demand resource materials such as the "Resource Guide," "Science In Your Shopping Cart," and "A History of American Agriculture, 1776-2000" have not been updated nor made available.

Ms. Emerson. Would you describe what you would do with the additional funds that have been requested?

Response. Additional funding would allow the Department and the Agriculture in the Classroom community to expand education outreach activities

to under-represented groups, support regional demonstration projects, continue the integration of information technology to lower program delivery costs, and increase outstanding teacher recognition initiatives.

Other planned initiatives include the development of materials which portray scientifically-accurate and technologically-advanced agriculture, dissemination of materials about career opportunities in the food and agriculture arena, research and evaluation of program components, an expanded network of educators involved in promoting agricultural literacy, and strengthened relationships between the Agriculture in the Classroom community and our partnering college and university systems.

FORMULA FUNDING

Ms. Emerson. Last year, you proposed cuts in Smith-Lever, Hatch Act, and other formula funds. Those cuts were disapproved by this Subcommittee. As a strong supporter of providing adequate levels of base research funding, I was pleased that you did not propose similar cuts this year. Can you explain the change of heart on this issue at USDA from last year to this year?

Response. The FY 2001 budget request is a conscious effort to address concerns raised about the distribution of funding between formula grant programs and competitive grant programs in the Administration's FY 2000 Budget. In order to reduce the disparity in funding between formula and competitive grant programs, the FY 2000 budget proposed $200 million for the National Research Initiative--NRI--and $489 million for the six major formula programs--a reduction from the FY 1999 enacted level of $540 million. In response to the concerns raised about this reduction, the FY 2001 budget has proposed to fund major formula programs at the FY 2000 enacted level of $542 million, and to request a more modest funding level of $150 million for the NRI, which we hope the committee will approve.

Food Embargoes

Ms. Emerson: As you know, the issues of food embargoes is of serious concern to America's farmers and ranchers and to this Congress. I feel very strongly that the President should lift these food embargoes and open up these markets to our producers. In view of the fact that we are entering the third straight year of low commodity prices, we ought to be doing everything we can to open up overseas markets and find new customers for American agricultural commodities. Food embargoes are only hurting our farmers and ranchers right here at home. A case that really highlights the negative impact of embargoes is the U.S. rice industry. In three separate instances, the #1 export market for U.S. rice has been closed off to producers due to government imposed embargoes. In 1962, Cuba was the #1 export market for U.S. rice before the embargo. In 1989, Iraq was the #1 export market for U.S. rice before the embargo. In 1995, Iran was the #1 export market for U.S. rice before the embargo. Our rice farmers and in fact all of our producers deserve a lot better than this.

I am trying to determine the level of seriousness with which USDA is examining this issue and also how accurate its estimates are. The FAS study has been criticized for erring on the conservative side and underestimating the true negative impact on farmers. What is your opinion of the FAS study and how do you think it measures up to studies done in the private sector? For example, U.S. Wheat Associates has estimated that wheat farmers alone are losing as much as $320 million annually in sales. And the USA Rice Federation believes that Cuba alone is a $100 million sales opportunity for American rice.

Response: The last formal study of embargoes in the REE mission area of USDA was undertaken by ERS, in conjunction with the International Agricultural Trade Research Consortium, in the early 1980s following the Russian grain embargo. ERS did not participate directly in the recent FAS embargo study.

FAS's $500 million estimate of U.S. agricultural export gains (about 1 percent of total export value) resulting from the removal of sanctions on 6 countries seems to be reasonable, given the assumptions used in the analysis. The FAS analysis assumed that: (1) U.S. exporters would be as competitive in sanctioned markets as they are in non-sanctioned markets, i.e., get the same share of sanctioned country imports as the U.S.'s share in the rest of the world; (2) U.S. exporters would have access to the full range of export programs (GSM, DEIP, EEP, FMD, MAP, and food aid) that are available for exports to non-sanctioned countries; (3) U.S. shipment gains to sanctioned markets are partly offset by the diversion of our competitors' sales to other markets that U.S. exports also supply; and (4) that there are no changes in total world trade as a result of the removal of sanctions. Alternative assumptions or methods could result in somewhat higher or lower estimates of U.S. export gains.

I do not know what assumptions and methods were used in the private sector studies. Losses of wheat exports, according to the FAS study, were larger than for any other product, and rice was also significantly affected.

The major unknowns in any analysis of the trade impacts of removing sanctions are (1) how much of the previously sanctioned importer's market will be captured by the United States, and (2) how much of displaced exports from competing exporters will be diverted to non-sanctioned countries that have been U.S. markets. The actual outcome will differ by commodity and by country, and will be affected by U.S. and competitors' use of export programs, by the effectiveness of commercial marketing channels, by location and comparative advantage, and by politics in the previously sanctioned country.

QUESTIONS SUBMITTED BY CONGRESSWOMAN DELAURO

Ms. DeLauro: An ongoing concern, particularly in my home state of Connecticut, is the debilitating effects of Lyme Disease. I want to thank you for your support of efforts to find a cure to this disease. Currently, there is an on-going pilot program to study deer ticks that carry the disease. Would you give me an update on its progress?

Response: The '4-poster' study has just completed its second year and only preliminary data has been gathered, which indicates significant reduction in nymphal ticks that carry the Lyme disease agent. A better assessment of the impact of this project will be available after the tick density is obtained this summer and fall. However, a complete assessment of the effectiveness of the '4-poster' technology will come at the end of the 5th year of the pilot test. In RI, CT, NY and NJ deer have become accustomed to the '4-poster' devices as indicated by the corn consumed. On this basis, there is a four to five fold increase in deer density in CT and NY, respectively, than was anticipated given the original estimate of 20 deer per square mile. Other unanticipated problems include corn waste caused by squirrel feeding (they take one bite from a kernel then discard it); to counter this problem, ARS provided funds to pay for the cost of extra corn and to install squirrel excluders designed by ARS scientists. Depending on the outcome of the '4-poster' study, ARS will develop strategies to further evaluate and improve the '4-poster' technology by extending the test to other locations. ARS has also been requested by health authorities in PA and MA to extend the '4-poster' study to their states.

Ms. DeLauro: Earlier last fall, communities in southwestern Connecticut - New Haven, Orange, Westport and many other towns - as well as throughout the New York area, experienced an alarming outbreak of the West Nile River Virus. This mosquito-borne virus has never before found in the western hemisphere. In Connecticut, the disease had a visible effect on wildlife in the state, killing a number of crows and other birds. Has the ARS taken any steps to investigate this new disease? If so, would you provide details of your progress? What are the next steps?

Response: ARS took several steps soon after the West Nile River Virus (WNV) outbreak in New York in August, of 1999, and later in Southwestern Connecticut. ARS scientists at the Southeast Poultry Research Laboratory, Athens, Georgia, conducted tests on chicken and turkey to assess the risk of the WNV to U.S. poultry. The result showed that though WNV infects poultry, and the birds become viremic, the virus does not cause disease or clinical systems. ARS scientists at Gainesville, Florida, are collaborating with Yale University and the Center for Disease Prevention and Control, Ft. Collins, Colorado, to determine the prevalence of WNV in the most common mosquito species in New York, Connecticut, and other adjoining States, and to determine risk of exposure to wildlife and humans in other States.

Mosquito and Fly Research Unit scientists at the ARS Center for Medical, Agricultural, and Veterinary Entomology in Gainesville, Florida have developed two new types of adult mosquito traps (ie., the "Mosquitomagnet" and the "Dragonfly") that are highly sensitive to a broad range of mosquito species even when mosquito populations densities are low. ARS is utilizing these traps in the Bronx-Zoo, in cooperation with scientists from Yale University for three purposes: (1) to make a comprehensive evaluation of the bird and mammal feeding mosquito fauna in the zoo environment, (2) to evaluate the mosquitos that are collected in the traps for the presence of WNV, and (3) to determine the feasibility of using the new mosquito traps to "trap-out" and eliminate local mosquito populations as a non-pesticidal method of WNV vector control and for the protection of zoo animals from mosquito bites. ARS

scientists will determine factors affecting trap placement and operation and will identify mosquito species. Yale scientists will provide a liaison with Bronx Zoo officials, operate/maintain the mosquito traps, make mosquito identifications, and assay mosquitoes for the presence of WNV.

This pilot test will result in; (1) the development of new mosquito vector detection and population monitoring technology, including the potential for accurate identification of WNV vectors; (2) the development of a non-pesticidal technique for the abatement of mosquito WNV vectors; and (3) a novel, pesticide-free method for the protection of zoo animals from mosquito attack and infection with WNV.

Ms. DeLauro: As part of its mandate to cut 0.38% from the FY00 budget, the USDA made significant cuts - as much as 15% in places - to vital research projects such as animal vaccine research conducted by University of Connecticut with the University of Montana, and Lyme Disease research at Yale University. I am very concerned that these cuts will significantly limit the amount of progress in these important areas of research. Would you provide me with a status report on these two projects, and what changes or cut backs were made to compensate for the loss of funds?

Response: The new animal vaccines research at the University of Connecticut and at the University of Montana will initiate high priority research on vaccines for poultry and cattle and will be the basis for a collaborative relationship among institutions. The reduction of funding in the first year of the program is expected to only modestly impact the new program and will slightly delay the future achievement of new vaccines.

The objectives of the new research at Yale are to: (1) develop surveillance techniques for new or resurgent diseases, such as ehrlichiosis, babesiosis and other tick-borne viral diseases affecting humans and domestic animals; (2) determine risk of exposure to animals and humans; (3) determine role of environmental changes in resurgence and transmission of these diseases; and (4) develop and test intervention methods for the control and prevention of tick-borne diseases. The mandated cuts in Yale funding will delay the progress in achieving the above four objectives, however, this mandated cut in funding will not impact the ongoing 5-year Lyme tick '4-poster' project in Connecticut, New York, Rhode Island, New Jersey and Maryland.

Cooperative State Research, Education and Extension Service

BARD

Mr. Skeen. The U.S.-Israeli Binational Agricultural Research and Development Program, established in 1977, has had joint support for many years. Last year you reported that the total endowment amount was $110 million. This year you are requesting an increase of $2 million. Please provide for the record, a detailed explanation of how the requested funds would be used.

Response. The requested funds of $2 million would be used to increase the dollar amount and the number of joint U.S.-Israel research project awards submitted to BARD for funding. BARD's income derives from interest earned on a fixed endowment of $110 million and, in recent years, an annual budget allocation. Both the endowment and the annual allocation are contributed in equal parts by the governments of the United States and Israel. The annual budget of approximately $8.3 million --$7.5 million from interest and $.8 million from the annual allocation--is also divided equally between U.S. and Israeli scientists.

During its 22 years of operation, BARD has funded over 800 research projects out of 2,800 submitted proposals. BARD supports mission-oriented research, funding both strategic and applied research of agricultural problems. The majority of BARD projects have focused on means to increase agricultural productivity, particularly in dry and hot climates, with emphasis on plant and animal health, food quality and safety, and environmental issues. During the past 20 years, BARD has supported nearly $50 million of agricultural research in the U.S. About 75 percent has been awarded to Land Grant universities, 15 percent to Agricultural Research Service scientists, and the remaining 10 percent to other non-profit institutions.

BARD is unique among U.S. agencies funding agricultural research because of the binational financial partnership of BARD that provides each country a double project for the same price. The U.S. financial contribution to the BARD program remains in the U.S. to serve the research programs of American scientists. Primary factors that have contributed to this successful collaboration are BARD's proposal evaluation procedures, and the highly developed, sophisticated, and intensive Israeli agricultural sector that shares many agricultural problems with the U.S. Similar examples can be cited in the fields of irrigation, efficient use of water in dry climates, and other areas in which Israeli scientists have had significant achievements because the association of U.S. scientists with their Israeli counterparts enhances application of the research results.

Mr. Skeen. What is the current interest rate at which the corpus is accumulating funds?

Response. The current interest rate at which the corpus accrues interest to fund the research is 7 percent for the original investment of $80 million and 6.9 percent for the additional
$30 million which is invested at the London Interbank Offer Rate.

Mr. Skeen. Has Israel matched all U.S. funding in this account? What is the total amount of Israeli funding to date?

Response. Yes, Israel has matched all U.S. funding in this account. The total amount of Israeli funding to date is $55 million to the endowment plus $10.8 million in supplemental funds matching the U.S. fiscal year 1994-1999 contributions.

Mr. Skeen. For the record, please provide some specifics of what has been accomplished so far in this research project.

Response. The benefits to the U.S. from BARD research achievements are very significant. Citing two figures from an external U.S. economic impact study conducted illustrates this point:

- A 4-8 percent saving in poultry feed cost--with improved quality by leaner meat production--benefitted the U.S. broiler industry by $100 million a year.

- A model developed--with a computerized program available to farmers--for optimizing fertilization and irrigation of cotton, saves farmers an average of about $60 per acres or plus/minus $48 per bale.

Some of the recent accomplishments of the BARD Program include:

Biocontrol of Postharvest Diseases of Fruits

Over 25 percent of harvested fruits and vegetables are lost to Postharvest decay. Health and environmental concerns demand the development of biologically-based alternatives to synthetic fungicides. Scientists from the University of California, Riverside and the Israeli Agricultural Research Organization--ARO--have elucidated and characterized a novel mechanism of resistance to pathogens based on the presence of preformed antifungal compounds in the peel of unripe avocado that inhibit fungal attacks. Based on their findings, nonpathogenic transgenic strains of *Colletotrichum* that enhance antifungal compounds were developed. In another project, ARS scientists, in cooperation with ARO scientists, have developed the first commercial biofungicide based on yeast that naturally occurs on the surface of citrus fruit. This study contributed to the fundamental understanding of the mode of action of yeasts which will contribute to the development of the next generation of Biocontrol agents.

Biocontrol of Soilborne Pathogens

With the elimination of the use of methyl bromide, the control of soilborne diseases are a major problem for many horticultural producers. Scientists from Cornell University and Hebrew University have advanced the technology such that special strains of Trichoderma are being commercialized to control soilborne pathogens. Trichoderma inhibits and kills target fungal pathogens in a process where one fungus parasitizes another through enzymatic degradation. A combination of these genes expressed in plants like potato can produce near immunity levels of defense against root and leaf infecting fungi. Several of the strains developed are being used commercially in Israel, Europe, and the United States for greenhouse, turf, and row crops. Genes are being licensed or sub-licensed to companies for use in plants, including alfalfa, turf, ornamentals, apples, tobacco, potatoes, and grapes.

Increased Efficiency of Poultry Production by Feed Restrictions

Poultry studies have demonstrated that birds subjected to feed restriction early in life exhibited compensatory growth and grew faster than their unrestricted counterparts. ARS and ARO scientists teamed up through a series of BARD-supported projects to elucidate the mechanism of poultry growth stimulation brought about by early feed restriction and optimal conditions for its application. This project both substantiated and quantified the relationship between restriction and growth compensation. The data led to the development of a mathematical model which was incorporated into a computer

software package patented by the ARO. Feed deprivation also resulted in positive changes in meat quality. An economic impact study of this research revealed that feed restriction reduces production costs by 2 percent. In 1998 alone, gross benefits to the U.S. broiler industry were calculated at $117 million.

Greenhouse Management on Auto Pilot

A significant portion of the vegetables and ornamental plants produced in Israel and the United States are raised in environmentally-controlled greenhouses. The efficiency of this form of agriculture depends on high-precision computerized operation to control the environment automatically. These systems depend on models based on indoor and outdoor conditions and needs of the crop. BARD has supported science and engineering to achieve automated optimal growing conditions for different crops. A team led by the Israeli Technion University has cooperated with Cornell University to produce an optimal CO_2 enrichment scheme for tomato seedlings which boosts growth. In cooperation with the University of Florida, the Technion group developed an optimal greenhouse environment. Results of these projects were applied to a comprehensive model TOMGROW, and became a standard plant growth model world-wide. Cooperation between Israel and Florida demonstrated that on-line operation is possible in peppers and cucumbers. In cooperation with Cornell, the models have become accurate enough to predict failure. Their approach can be applied to any cropping system provided that the system is properly modeled.

Selective Breeding of Farmed Fish

Considerable efforts have been made to find reliable ways to produce all male tilapia progeny. Tilapia farmers prefer all male stock for three reasons: (1) Males have a naturally higher growth rate than females, (2) Reproduction leads to overcrowding, which slows the growth rate of both male and female fish, and (3) The expected survival rate is higher in all-male environments compared to mixed-sex environments. Scientists from Auburn University and the ARO have collaborated in successful production of monosex male tilapia fry. This research resulted in development of reliable alternative methods to manual segregation of male fingerlings that reduced feed cost by 25 percent because of a shortened growing period. Creating all-male fingerling stock by subjecting hybrid progeny to sex-reversal, generated more than $5.8 million in benefits to the U.S. tilapia industry in one year alone. By the year 2010, due directly to results of this research, the benefits are estimated to exceed $95 million.

HATCH ACT

Mr. Skeen. For the record, provide a list showing the allocation of Hatch Act funding per University in fiscal years 2000 and 2001.

(The information follows.)

HACTCH ACT FUNDS

Recipient	Fiscal Year 2000	Fiscal Year 2001
Auburn University	$3,772,901	$3,772,901
University of Alaska	948,317	948,317
American Samoa Community College	695,535	695,535
University of Arizona	1,865,058	1,865,058
University of Arkansas	3,267,458	3,267,458
University of California	4,942,054	4,942,054
Colorado State University	2,485,603	2,485,603
Connecticut Agricultural Experiment Station	772,104	772,104
University of Connecticut	982,676	982,676
University of Delaware	1,241,658	1,241,658
University of District of Columbia	606,843	606,843
University of Florida	2,832,357	2,832,357
University of Georgia	4,582,662	4,582,662
University of Guam	821,176	821,176
University of Hawaii	1,242,768	1,242,768
University of Idaho	2,021,699	2,021,699
University of Illinois	5,386,100	5,386,100
Purdue University	4,773,470	4,773,470
Iowa State University	5,829,391	5,829,391
Kansas State University	3,260,086	3,260,086
University of Kentucky	4,807,285	4,807,285
Louisiana State University	3,036,453	3,036,453
University of Maine	1,756,426	1,756,426
University of Maryland	2,357,908	2,357,908
University of Massachusettes	2,123,934	2,123,934
Michigan State University	4,868,512	4,868,512
College of Micronesia	713,237	713,237
University of Minnesota	4,737,649	4,737,649
Mississippi State University	3,852,446	3,852,446
University of Missouri	4,517,560	4,517,560
Montana State University	2,015,487	2,015,487
University of Nebraska	3,206,965	3,206,965
University of Nevada	1,163,570	1,163,570
University of New Hampshire	1,382,125	1,382,125
Rutgers University	2,717,411	2,717,411
New Mexico State University	1,549,115	1,549,115
Cornell University	1,366,952	1,366,952
Geneva Agricultural Experiment Station, NY	3,890,555	3,890,555
North Carolina State University	6,199,875	6,199,875
North Dakota State University	2,286,655	2,286,655
Northern Marianas College	661,459	661,459
Ohio Agricultural Research and Development Center	5,638,750	5,638,750
Oklahoma State University	2,962,112	2,962,112
Oregon State University	2,738,540	2,738,540
Pennsylvania State University	5,873,636	5,873,636

University of Puerto Rico	3,884,688	3,884,688
University of Rhode Island	1,181,131	1,181,131
Clemson University	3,254,459	3,254,459
South Dakota State University	2,352,818	2,352,818
University of Tennessee	4,572,590	4,572,590
Texas A&M University	6,248,217	6,248,217
Utah State University	1,736,658	1,736,658
University of Vermont	1,388,128	1,388,128
College of the Virgin Islands	802,359	802,359
Virginia Polytechnic Institute	3,961,453	3,961,453
Washington State University	3,506,155	3,506,155
West Virginia University	2,542,698	2,542,698
University of Wisconsin	4,873,605	4,873,605
University of Wyoming	1,480,124	1,480,124
Subtotal	170,539,616	170,539,616
Biotechnology Risk Assessment	221,140	221,140
Current Research Information System	219,398	219,398
Federal Administration	5,180,739	5,180,739
Small Business Innovation Research	4,384,107	4,384,107
TOTAL	180,545,000	180,545,000

HATCH ACT

Mr. Skeen. How are the universities able to absorb inflationary costs with static funding requests?

Response. The laws authorizing Federal formula programs enable the States to determine how to use their formula allocations to address critical issues facing agriculture in their States, region, and the Nation. While Federal formula funds are an important source of funding for universities, they are not the only source of funds they have to support research, education, and extension activities. Funding from non-Federal sources and the flexibility to address the high priority issues gives the States the ability to manage effective programs with level funding.

MCINTIRE-STENNIS FORESTRY GRANTS

Mr. Skeen. For the record, please provide a list showing the allocation of McIntire-Stennis funding per University for fiscal years 2000 and 2001.

(The information follows.)

MCINTIRE-STENNIS FORESTRY FUNDS

Recipient	Fiscal Year 2000	Fiscal Year 2001
Auburn University	$704,201	$704,201
University of Alaska, Fairbanks	459,460	459,460
University of Arizona	309,897	309,897
Agriculture Experiment Station, University of Arkansas	609,024	609,024
California Polytech State University	32,491	32,491
California State University, Humboldt	97,472	97,472
University of California	519,851	519,851
Colorado State University	296,300	296,300
Connecticut Agricultural Experiment Station	168,954	168,954
Storrs Agricultural Experiment Station	59,363	59,363
University of Delaware, Agricultural Experiment Station	65,156	65,156
University of Florida Agricultural Experiment Station	554,637	554,637
University of Georgia School of Forest Resources	744,991	744,991
University of Guam	37,963	37,963
University of Hawaii	173,930	173,930
University of Idaho	473,057	473,057
Southern Illinois University	175,344	175,344
University of Illinois	175,343	175,343
Purdue University	377,880	377,880
Iowa State University, Agriculture and Home Economics Experiment Station	269,107	269,107
Kansas State University	160,333	160,333
University of Kentucky Agricultural Experiment Station	418,670	418,670
Louisiana State University School of Forestry	435,834	435,834
Louisiana Technological University, School of Forestry	186,786	186,786
University of Maine	581,830	581,830
University of Maryland	241,913	241,913
University of Massachussetts	282,703	282,703
Michigan State University	212,071	212,071
Michigan Technological University	212,071	212,071
University of Michigan	212,071	212,071
University of Minnesota	527,444	527,444
Mississippi State University	677,007	677,007
University of Missouri, School of Forestry	445,863	445,863
University of Montana, Forestry and Conservation Experiment Station	432,267	432,267
University of Nebraska	133,140	133,140
University of Nevada, Mac C. Fleischmann College of Agriculture	119,543	119,543
University of New Hampshire	323,493	323,493
Rutgers State University, Agricultural Exper. Station	201,123	201,123
New Mexico State University, Las Cruces	255,510	255,510
Cornell University, New York College of Agriculture and Life Sciences	199,024	199,024

State University of New York, College of Environmental Science and Forestry	464,387	464,387
North Carolina State University	690,604	690,604
North Dakota State University and Applied Sciences	92,350	92,350
Ohio Agricultural Research and Development Center	391,477	391,477
Oklahoma State University	364,283	364,283
Oregon State University	731,394	731,394
Pennsylvania State University, Agricultural Experiment Station	513,847	513,847
University of Puerto Rico, Agricultural Experiment Station	105,946	105,946
University of Rhode Island Recreation Resources	78,753	78,753
Clemson University of Forestry and Recreation	541,040	541,040
South Dakota State University	146,736	146,736
University of Tennessee	500,250	500,250
Stephan F. Austin State University, Texas	297,713	297,713
Texas A&M University Agricultural Experiment Station	297,714	297,714
Utah State Agricultural Experiment Station	173,930	173,930
University of Vermont	337,090	337,090
College of the Virgin Islands	51,560	51,560
Virginia Polytechnic Institute and State University	568,234	568,234
University of Washington, Seattle	394,786	394,786
University of Washington, Pullman	323,008	323,008
West Virginia State University	405,076	405,076
Uuniversity of Wisconsin, Agricultural Exper. Station	486,654	486,654
University of Wyoming, Laramie	214,720	214,720
Subtotal	20,734,669	20,734,669
Biotechnology Risk Assessment	7,520	7,520
Federal Administration	657,960	657,960
Small Business Innovation Research	531,851	531,851
TOTAL	21,932,000	21,932,000

MCINTIRE-STENNIS FORESTRY GRANTS

Mr. Skeen. What are some of the recent accomplishments from this funding? Please include your world-wide-web site address in your response.

Response. The McIntire-Stennis Cooperative Forestry Research program continues to support research essential to the efficient and effective use of the Nation's forest resources. Timber production, forest land management, wood utilization, and the associated development of new products and distribution systems continue to be the key elements of forestry research. Additional areas of investigation include wildlife, recreation, water, range, and environmental quality. The McIntire-Stennis program also continues to help create and maintain a highly qualified cadre of forest scientists through students' direct involvement in research projects as a part of their graduate education. The CSREES world-wide-web address is http://www.reeusda.gov/.

PAYMENTS TO 1890 COLLEGES

Mr. Skeen. Provide a list showing the allocations by College and University for the 1890 formula grants.

(The information follows.)

CSREES Research and Education Activities: Evans-Allen Program Institution	Fiscal Year 1999 Actual	Fiscal Year 2000 Estimate	Fiscal Year 2001 Estimate
Alabama A&M University	$1,619,645	$1,619,671	$1,619,671
Tuskegee University	1,600,476	1,600,501	1,600,501
University of Arkansas, Pine Bluff	1,421,544	1,421,565	1,421,565
Delaware State University	547,569	547,577	547,577
Florida A&M University	1,201,917	1,201,936	1,201,936
Fort Valley State College, Georgia	1,828,698	1,828,727	1,828,727
Kentucky State University	2,123,988	2,124,022	2,124,022
Southern University and A&M College, LA.	1,295,549	1,295,569	1,295,569
University of Maryland, Eastern Shore	958,801	958,815	958,815
Alcorn State University, Mississippi	1,638,091	1,638,116	1,638,116
Lincoln University, Missouri.	2,031,527	2,031,558	2,031,558
North Carolina A&T State University	2,618,546	2,618,586	2,618,586
Langston University, Oklahoma	1,337,421	1,337,442	1,337,442
South Carolina State University	1,406,204	1,406,226	1,406,226
Tennessee State University	1,995,068	1,995,099	1,995,099
Prairie View A&M University	2,664,958	2,664,999	2,664,999
Virginia State University	1,716,725	1,716,758	1,716,758
West Virginia State University	0	975,000	975,000
Total Payment To States	28,006,727	28,982,167	28,982,167
Small Business Innovation Research	719,643	744,643	744,643
CRIS	38,600	38,600	38,600
Biotech Risk Assessment	20,750	20,310	20,310
Federal Administration	890,280	890,280	890,280
Total, Evans-Allen Program	29,676,000	30,676,000	30,676,000

CSREES Extension Activities: Payments to 1890 Institutions	Fiscal Year 1999 Actual	Fiscal Year 2000 Estimate	Fiscal Year 2001 Estimate
Institution			
Alabama A&M University	$1,328,487	$1,328,487	$1,328,487
Tuskegee University	1,328,487	1,328,487	1,328,487
University of Arkansas, Pine Bluff	1,199,832	1,199,832	1,199,832
Delaware State University	433,652	433,652	433,652
Florida A&M University	1,117,451	1,117,451	1,117,451
Fort Valley State College, Georgia	1,600,131	1,600,131	1,600,131
Kentucky State University	2,004,220	2,004,220	2,004,220
Southern University and A&M College, LA	1,101,869	1,101,869	1,101,869
University of Maryland, Eastern Shore	847,013	847,013	847,013
Alcorn State University, Mississippi	1,311,143	1,311,143	1,311,143
Lincoln University, Missouri.	2,002,099	2,002,099	2,002,099
North Carolina A&T State University	2,384,762	2,384,762	2,384,762
Langston University, Oklahoma	1,196,996	1,196,996	1,196,996
South Carolina State University	1,162,178	1,162,178	1,162,178
Tennessee State University	1,802,935	1,802,935	1,802,935
Prairie View A&M University	2,466,029	2,466,029	2,466,029
Virginia State University	1,521,996	1,521,996	1,521,996
West Virginia State University	0	1,000,000	1,000,000
Total Payment To States	24,809,280	25,809,280	25,809,280
Federal Administration	1,033,720	1,033,720	1,033,720
Total, Payments to 1890 Institutions	25,843,000	26,843,000	26,843,000

FISCAL YEAR 2001 BUDGET REQUEST

Mr. Skeen. Please provide for the record the fiscal year 2001 budget funding level, by program, requested by the Cooperative State Research, Education, and Extension Service (CSREES) to the Secretary, the level requested by the Secretary to OMB, and the final OMB allowance. Please provide this information for each of the categories reflected in the summary table on pages 1291 and 1292 of last year's hearing record.

(The information follows.)

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE
FY 2001 AGENCY ESTIMATE, FY 2001 DEPARTMENT ESTIMATE, AND FY 2001 PRESIDENT'S BUDGET
(Dollars in Thousands)

PROGRAMS		FY 2001 AGENCY ESTIMATE	FY 2001 DEPARTMENT ESTIMATE	FY 2001 PRESIDENT'S BUDGET
Research and Education Activities				
Base Programs:				
Hatch Act		180,545	180,545	180,545
McIntire-Stennis Cooperative Forestry		21,932	21,932	21,932
Evans-Allen Program		29,676	30,676	30,676
Animal Health & Disease, Section 1433		5,109	5,109	5,109
Subtotal		237,262	238,262	238,262
Special Research Grants:				
Critical Issues		467	467	467
Expert IPM Decision Support System		260	260	260
Food Safety	a/	0	0	0
Global Change, UV- Monitoring		1,567	1,567	1,567
Integrated Pest Mgmt.		2,731	2,731	2,731
Minor Crop Pest Management, IR-4 (Pest. Clearance)		10,711	10,711	10,711
Minor Use Animal Drugs		550	550	550
National Biological Impact Assessment Program		254	254	254
Pesticide Impact Assessment	a/	0	0	0
Pest Management Alternatives (Emerging Pest & Dis.)		4,200	4,200	4,200
Rural Development Centers		523	523	523
Regional crop information and Policy Centers		0	3,000	1,500
U.S./Israel - Binat'l. Ag Res. and Devel. (BARD)		2,000	2,000	2,000
Water Quality	a/	0	0	0
Other		0	0	0
Subtotal		23,263	26,263	24,763
National Research Initiative Competitive Grants Program (NRI):				
Natural Resources and the Environment		32,000	32,000	25,000
Nutrition, Food Safety, and Health		28,000	28,000	22,000
Plants		69,000	69,000	48,000
Animals		49,000	49,000	35,000
Markets, Trade, and Rural Development		8,000	8,000	7,000
Process. for Adding Value/Devel. New Products		14,000	14,000	13,000
Subtotal		200,000	200,000	150,000
1994 Competitive Research Grants		2,000	1,000	1,000
Other Research:				
Critical Ag Materials		0	0	0
Aquaculture Centers		4,000	4,000	4,000
Sustainable Agriculture Program		12,500	12,500	10,500
Supplemental and Alternative Crops		0	0	0
Federal Administration (Direct Appropriation):				
REEIS		2,500	2,500	2,250
Pay Cost		1,693	1,693	1,100
Office of Extramural Programs		588	588	588
Peer Panels		350	350	350
Other		0	0	0
Subtotal		21,631	21,631	18,788

Research and Education Activities Cont'd.				
Higher Education:				
Graduate Fellowships Grants		9,000	6,000	5,000
Institution Challenge Grants		10,000	7,350	6,000
1890 Institution Capacity Building Grants		10,000	10,000	9,500
Multicultural Scholars Program		6,000	3,000	2,000
Hispanic Serving Institutions Educ. Grants Prog.		5,000	5,000	3,500
Secondary Agriculture Education		2,000	1,000	500
Payment to the 1994 Institutions		1,552	1,552	1,552
Native American Institution Endowment Fund		4,600	4,600	7,100
Subtotal		48,152	38,502	35,152
Total, Research and Education		532,308	525,858	467,965
Buildings and Facilities		0	0	0
Total, Research and Education Activities		532,308	525,658	467,965
Extension Activities				
Smith-Lever Formula 3(b) & (c) b/		276,548	276,548	276,548
1890 Institutions		25,843	26,843	26,843
Smith-Lever 3(d)				
Water Quality	a/	0	0	0
Children, Youth, and Families at Risk		10,000	10,000	10,000
Youth Farm Safety Education and Certification		0	0	5,000
Food Safety	a/	0	0	0
Farm Safety		0	0	0
Pest Management		12,269	12,269	12,269
Pesticide Impact Assessment	a/	0	0	0
Pesticide Applicator Training		1,500	1,500	1,500
EFNEP		61,043	61,043	61,043
Rural Development Centers		908	908	908
Extension Indian Reservations Program		8,000	5,000	5,000
Sustainable Agriculture		5,309	5,309	4,500
Renewable Resources Extension Act		3,192	3,192	3,192
Rural Health and Safety		0	0	0
Extension Services at the 1994 Institutions		3,500	3,500	3,500
1890 Facilities (Section 1447)		12,000	12,000	12,000
Federal Administration:				
Ag in the Classroom		1,000	1,000	476
Other		6,132	6,132	5,457
Total, Extension Activities		427,244	425,244	428,236
Integrated Activities				
Small Farms Initiative		4,000	4,000	4,000
Water Quality		16,204	16,204	16,204
Food Safety		15,000	15,000	15,000
Pesticide Impact Assessment		4,640	4,640	4,640
Child Care		5,000	0	0
International Science & Education Grants		22,500	3,000	1,000
Biobased		6,000	3,000	9,600
Invasive Species		10,000	3,000	1,500
FQPA Risk Mitigation Program for Major Food Crop Systems		10,000	10,000	10,000
Crops at Risk from FQPA Implementation		3,000	5,000	3,000
Methyl Bromide Transition Program		5,000	5,000	5,000
Organic Transition Program		0	2,000	1,000
Anti-Hunger and Food Security		0	0	5,250
Food Recovery and Gleaning		15,000	15,000	0
Total, Integrated Activities		116,344	85,844	76,194
Total, Cooperative State Research, Education, and Extension Service		1,075,896	1,036,746	972,395

a/ Included in Integrated Activities
b/ Includes D.C. Extension Funding.

BUDGET DECREASES FOR CONGRESSIONAL ADD-ONS

Mr. Skeen. The budget proposes to eliminate over $57 million in funding for Special Grants that was provided in the fiscal year 2000 appropriations. Many of these special grants have strong constituent support, and provide significant contributions to American agriculture. The rationale you provide in your budget justification is that these grants do not meet national goals or are not competitively awarded. Please elaborate on how alternate funding from formula programs, state and local governments, etc., could be used to support these grants. If possible, please provide funding options for each project you have proposed for termination.

Response. The laws authorizing Federal formula programs administered by CSREES enable states to determine how to use their formula allocations for specific projects or programs to address critical issues facing agriculture in their states, region, and/or the nation. We believe that formula funding could be used by states to support projects currently being supported through Congressional earmarks since formula funding addresses a broad array of research subject areas. For example, the areas of research supported with Hatch Act formula funding include forest and natural resources; crop resources; animal resources; people, communities, and institutions; competition, trade, adjustment, price and income policy; and food science and human nutrition. The areas of research supported with McIntire-Stennis formula funding include timber production; forest land management; wood utilization; the associated development of new products and distribution systems; and wildlife, recreation, water, range, and environmental quality. Evans-Allen formula funding supports research emphasizing small-scale agriculture; human nutrition; rural development and quality of living; crop resources; and animal resources. Animal Health and Disease formula funding supports research that improves the health and productivity of animals; protecting human health through control of animal diseases transmissable to humans; minimizing livestock and poultry losses resulting from transportation and handling; and facilitating the effective treatment and prevention of animal diseases.

Alternately, funding for projects supported through earmarked special grants could come from industry, commodity groups, or other sources. For example, the Nonfood Agricultural Products--Nebraska--special grant supported in the CSREES budget receives support from the Nebraska Corn, Soybean, Wheat Sorghum, and Beef Boards; World Wildlife Fund; Nebraska Bankers Association; United Soybean Board and National Corn Growers Association; Bioplastics, Inc.; Biofoam, Inc.; and M.C.C. Technologies, Inc. Many of the special grants are supported also by state appropriations, indicating an interest at the state level for the issues to be addressed.

Further, states could submit proposals for these projects to competitive programs. While competitive grant program areas address broad national priorities, the individual proposals which are submitted and funded may represent issues of particular local concern. For example, fiscal year 2001 marks the second year in which the CSREES budget has contained a request to support competitive grants for Methyl Bromide alternatives. This program, supported under the integrated research, extension, and education competitive grants program authorized under Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998, will benefit producers in very specific areas of the country while addressing a pressing national need.

Project	1999 Appropriation	2000 Appropriation	2001 Pres. Budg.
Illinois-Missouri			
Alliance for Biotechnology	1,184,000	1,184,000	--
Improved dairy management, PA	296,000	296,000	--
Improved early detection of crop diseases (NC)	--	170,000	--
Improved fruit practices, MI	445,000	445,000	--
Infectious disease research, CO	250,000	255,000	--
Institute for food science and engineering, AR	1,250,000	1,250,000	--
Integrated production systems, OK	180,000	180,000	--
International agricultural market structures and institutions, KY	250,000	250,000	--
International arid lands consortium	400,000	400,000	--
Iowa Biotechnology Consortium	1,564,000	1,564,000	--
Jointed Goatgrass, WA	360,000	360,000	--
Livestock & dairy policy, NY & TX	475,000	475,000	--
Lowbush blueberry research, ME	220,000	220,000	--
Maple research, VT	100,000	100,000	--
Meadowfoam, OR	300,000	300,000	--
Michigan Biotechnology Institute	675,000	675,000	--
Midwest Advanced Food Manufacturing Alliance	423,000	423,000	--
Midwest agricultural products, IA	592,000	592,000	--
Milk safety, PA	250,000	297,500	--
Molluscan shellfish, OR	400,000	400,000	--
Multi-commodity research, OR	364,000	364,000	--
Multi-cropping strategies for aquaculture, HI	127,000	127,000	--
Nematode resistance genetic engineering, NM	127,000	127,000	--
Nevada Arid Rangelands Initiative	--	253,000	--
New corp opportunities, AK	--	425,000	--
New corp opportunities, KY	--	595,000	--
Nonfood agricultural products, NE	64,000	64,000	--
Oil resource from desert plants, NM	175,000	175,000	--
Organic waste utilization, NM	100,000	100,000	--
Pasture and forage research, UT	225,000	225,000	--
Peach tree shortlife, SC	163,000	162,000	--
Peanut Allergy Reaction, GC	--	425,000	--
Pest control alternatives	106,000	106,000	--
Phytophthora root rot, NM	127,000	127,000	--
Plant, drought, & disease resistance gene cataloging, NM	150,000	212,500	--
Postharvest rice straw, CA	300,000	--	--
Potato research	1,300,000	1,300,000	--
Precision agriculture, KY	500,000	850,000	--
Preharvest food safety, KS	212,000	212,000	--
Preservation and processing, OK	226,000	226,000	--
Rangeland ecosystems, NM	200,000	200,000	--
Red snapper research, AL	--	510,000	--
Regional barley gene mapping project	400,000	425,000	--
Regionalized implications of farm programs, MO & TX	294,000	294,000	--
Rice Modeling	296,000	296,000	--
Rural policies institute NE, MO, & AR	644,000	644,000	--
Russian wheat aphid	200,000	200,000	--
Seafood harvesting, processing, and marketing, AK	--	552,500	--
Seafood and aquaculture harvesting, processing, marketing, MS	305,000	305,000	--
Seafood safety, MA	--	253,000	--
Small fruit research, WA, OR & ID	300,000	300,000	--
Southwest consortium for plant genetics & water resources	338,000	338,000	--
Soybean cyst nematode, MO	475,000	475,000	--
STEEP II - Water quality in Pacific Northwest	500,000	500,000	--
Sustainable agriculture, CA	--	255,000	--
Sustainable agriculture, MI	445,000	445,000	--
Sustainable agriculture and natural resources, PA	95,000	95,000	--
Sustainable agriculture systems, NE	59,000	59,000	--
Sustainable beef supply, MT	500,000	637,500	--
Sustainable pest management for dryland wheat, MT	400,000	425,000	--
Swine waste management, NC	500,000	500,000	--
Tillage, silviculture, waste management, LA	212,000	212,000	--
Tomatoe wilt virus, GA	200,000	200,000	--
Trade and Policy Research Center, ND	--	--	--
Tropical aquaculture, FL	--	170,000	--
Tropical and subtropical research	2,724,000	2,724,000	--
Turkey carnavirus, IN	200,000	200,000	--
Urban pests, GA	64,000	64,000	--
Vidalia onions, GA	100,000	100,000	--
Viticulture, NY & CA	1,000,000	1,000,000	--
Water conservation, KS	79,000	79,000	--

BUDGET DECREASES FOR CONGRESSIONAL ADD-ONS

Mr. Skeen. For the record, please provide a detailed listing of all special research grants proposed for termination in fiscal year 2001, showing the fiscal year 1999 and 2000 funding for each.

(The information follows.)

RESEARCH AND EDUCATION ACTIVITIES
SPECIAL RESEARCH GRANTS
Budget Decreases for Congressional Add-ons

Project	1999 Appropriation	2000 Appropriation	2001 Pres. Budg.
Special Research Grants:			
Advanced spatial technologies, MS	$ 1,000,000	$ 1,000,000	--
Aflatoxin research, IL	113,000	113,000	--
Agricultural diversification, HI	131,000	131,000	--
Agricultural diversity Red River, MN & ND	250,000	250,000	--
Agriculture-based industrial lubricants, IA	250,000	250,000	--
Agricultural tele-communications, NY	--	425,000	--
Agriculture water usage, GA	300,000	300,000	--
Alliance for food protection	300,000	300,000	--
Alternative crops, ND	550,000	550,000	--
Alternative crops for arid lands, TX	100,000	100,000	--
Alternative marine & fresh water species, MS	308,000	--	--
Alternative salmon products, AK	400,000	552,500	--
Animal Science Food Safety Consortium	1,521,000	1,521,000	--
Apple Fire Blight, NY & MI	500,000	500,000	--
Aquaculture, LA	330,000	330,000	--
Aquaculture, NC	--	255,000	--
Aquaculture, VA	100,000	106,000	--
Aquaculture, Stoneville, MS	592,000	592,000	--
Aquaculture product and marketin & development, WV	750,000	750,000	--
Babcock Institute, WI	400,000	510,000	--
Barley feed for rangeland cattle, MT	600,000	637,500	--
Biodiesel research, MO	152,000	152,000	--
Blocking anhydrous methamphetamine production (IA)	--	212,500	--
Bovine tuberculosis (MI)	--	170,000	--
Brucellosis vaccines, MT	150,000	425,000	--
Center for animal health and productivity, PA	113,000	113,000	--
Center for innovative food technology, OH	391,000	--	--
Center for rural studies, VT	100,000	200,000	--
Chesapeake Bay agroecology, MD	150,000	150,000	--
Chesapeake Bay aquaculture, MD	385,000	385,000	--
Citrus tristeza	500,000	595,000	--
Coastal cultivars (GA)	--	170,000	--
Competitiveness of agriculture products, WA	680,000	680,000	--
Contagious equine metritis, KY	250,000	--	--
Cool season legume research	329,000	329,000	--
Cotton research, TX	200,000	--	--
Cranberry/blueberry, MA	150,000	150,000	--
Cranberry/blueberry disease and breeding, NJ	220,000	220,000	--
Dairy & meat goat research, Prairie View A&M, TX	63,000	63,000	--
Delta rural revitalization, MS	148,000	148,000	--
Designing foods for health, TX	250,000	318,750	--
Diaprepes/root weevil (FL)	--	297,500	--
Drought mitigation, NE	200,000	300,000	--
Ecosystems, AL	500,000	500,000	--
Environmental research, NY	486,000	400,000	--
Environmental Risk Factors/Cancer, NY	100,000	170,000	--
Environmentally-safe products (VT)	--	170,000	--
Expanded wheat pasture, OK	285,000	285,000	--
Farm and rural business finance, IL & AR	87,000	87,000	--
Floriculture, HI	250,000	250,000	--
Food & Agriculture Policy Institute, IA & MO	800,000	800,000	--
Food irradiation, IA	200,000	100,000	--
Food Marketing Policy Center, CT	400,000	400,000	--
Food processing center, NE	42,000	42,000	--
Food quality, AK	350,000	350,000	--
Food safety, AL	300,000	446,250	--
Food systems research group, WI	225,000	425,000	--
Forages for advancing livestock production (KY)	--	212,500	--
Forestry research, AR	523,000	523,000	--
Fruit & vegetable market analysis, AZ & MO	320,000	320,000	--
Generic commodity promotion, NY	212,000	198,000	--
Global marketing support service, AR	127,000	127,000	--
Grain Sorghum, KS	106,000	106,000	--
Grass seed cropping systems for sustainable agriculture	423,000	423,000	--
Human nutrition, IA	473,000	473,000	--
Human nutrition, LA	752,000	752,000	--
Human nutrition, NY	622,000	622,000	--
Hydroponic tomatoes	200,000	200,000	--

Project	1999 Appropriation	2000 Appropriation	2001 Pres. Budg.
Weed control	423,000	423,000	--
Wetland plants, LA	600,000	600,000	--
Wheat genetics, KS	261,000	261,000	--
Wood utilization	5,136,000	5,136,000	--
Wool research	300,000	300,000	--
TOTAL Special Research Grants proposed for termination.	51,928,000	57,721,500	0

AGENCY AUDITS

Mr. Skeen. Provide a brief description of all GAO, OIG, and internal audits that are ongoing.

Response. The following audits are ongoing:

Managing Facilities Construction Grants - Audit Report No. 50601-5-At

The audit disclosed that all facilities constructed with CSREES funds either fell within or were complementary to the research priorities of the Department. Also, the Office of Inspector General--OIG--visited six institutions and found that (1) the institutions adequately monitored project construction and compliance with Federal, State, and local laws relating to the construction of facilities, (2) the completed facilities were well maintained and used for their intended purposes, and (3) the institutions' financial and administrative records were satisfactory and matching requirements were met.

The audit also stated that CSREES needs to improve its administrative controls over the Facilities Construction Program to ensure that (1) residual grant funds were deobligated; (2) expenditures after grant expiration dates were for valid obligations; and (3) institutions obtained prior approval of construction-related contracts and submitted required performance and financial status reports so the agency could monitor construction and compliance with the grant terms and conditions. CSREES agreed with these audit recommendations and has taken corrective action to satisfy these audit recommendations. CSREES is also working with the OIG and one grantee involved in the audit to determine the allowability of questioned costs totaling $630,242.

National Research Initiative Competitive Grants Program (NRICGP) - Audit Report No. 13601-1-At

The audit recommended that CSREES (1) pursue a broader representation of panel members to prevent an apparent correlation between panel member composition and funding of awards; (2) revise eligibility and selection procedures for Strengthening Program awards to protect small and mid-size institutions against competition from large and well-funded institutions; (3) remove equipment grant stipulations in the Strengthening Program and require the grants to be subjected to the same criteria as other Strengthening Program grants; (4) obtain an opinion from the Office of the General Counsel--OGC--regarding (a) the legality of NRICGP's participation in the multi-agency research program, (b) the appropriateness of categorizing peer review costs as programmatic costs to the extent that the peer review costs exceed the 4 percent allowable for administrative fees, and (c) the appropriate funding basis to use in computing the level of required multi-disciplinary research; (5) conduct periodic reviews and make necessary adjustments in the NRICGP allocations for multi-disciplinary research grants to ensure that program funding complies with applicable legislation; and (6) develop a uniform accounting system for the NRICGP.

CSREES and the OIG do not agree on the corrective action to be taken relating to revising eligibility and selection procedures for Strengthening Program awards. The current eligibility and selection procedures for Strengthening Program awards satisfy the mandates set forth by Congress and adhere to CSREES policies and procedures for the program. Also, the eligibility and selection procedures have been reviewed and approved by the OGC. The procedures also have been published in the Federal Register for public comment. No comments were received regarding the need to revise eligibility and selection

procedures for Strengthening Programs to protect small and mid-size institutions against competition from large and well-funded institutions. OIG also proposes to consult with OGC on the recommendations relating to the appropriateness of categorizing peer review costs as programmatic costs and the appropriate funding basis to use in computing the level of required multi-disciplinary research. CSREES will continue to work with OIG to reach an acceptable resolution to these issues.

Use of Grant Funds by Langston University - Audit Report No. 13011-1-Te

The audit recommended that CSREES require Langston University to replace misused grant funds totaling over $1.2 million. OIG found that CSREES grant funds were used for the following unallowable purposes: planning costs for the construction of facilities when adequate construction funds were not available, construction equipment purchased that was not an allowable expenditure under authorizing statutes, research funds used to support students attending other universities, construction of a water tower without revealing relevant facts to CSREES, unallowable travel costs, extension funds used for research, and sales revenue funds used for purposes that did not further Evans-Allen program objectives. Langston University has provided CSREES with acceptable documentation to reduce the questioned costs in the audit to $566,673. To satisfy the debt of $566,673, Langston University also has identified other allowable costs that can be substituted for the disallowed costs. OIG is currently reviewing the other allowable costs to determine if they are acceptable as offset for the disallowed costs.

Adequacy of CSREES Assurances Over Appropriate Use of Funds Provided to Prairie View A&M University - Audit Report No. 13011-2-Te

The audit recommended that CSREES recover from Prairie View A&M University $1,239,314 in Federal funds disbursed for expired grants for which matching requirements were not met. OIG also recommended that CSREES ensure that matching costs claimed by Prairie View are documented, verifiable, and allowable under Federal rules. CSREES and OIG have determined that Prairie View A&M University did not comply with USDA regulations in documenting their cost sharing. While Prairie View A&M University did not fully comply with the recordkeeping requirements of the grant terms and conditions, CSREES believes sufficient value was received and proposes to waive recovery of the funds subject to the approval of the Office of the General Counsel. CSREES also has advised Prairie View A&M University of their responsibility to maintain appropriate documentation to support matching costs.

Use of 4-H Program Funds - University of Illinois - Audit Report No. 12011-1-Ch

CSREES and OIG have reached agreement on management decisions for five of the eight recommendations in the audit report. The three remaining unresolved recommendations related primarily to the issue of whether State Cooperative Extension Service--CES--employees, who hold Schedule A Federal appointments--approximately 8,000 employees--can be effectively covered by Federal due process for adverse personnel actions. CSREES contends that this group of employees is hired and separated under State-established procedures and appeals, and the Department has no decisionmaking role in their removal from their university appointments upon which their Federal Schedule A appointments are contingent. The OIG position is that this group of employees are covered under the Civil Service Due Process Amendments. To resolve these recommendations, CSREES has notified all Extension Directors/Administrators of the Federal appeal rights to be afforded to the CES employees covered by Federal Schedule A Excepted Service appointments. The issue of these Federal appointments is currently before the Merit Systems Protection Board--MSPB--,

and CSREES will not issue any additional guidance until MSPB reaches a decision. In addition, CSREES has established a Steering Committee to review and revise delegations of authority and the personnel policies and procedures set forth in the Agency's Administrative Handbook for CES Work for Federal Appointees. This is intended to clarify policies that are conflicting or confusing and ensure compliance with the Federal statutes and regulations. This will be an extensive project that may involve requesting a number of legal opinions and recommending and developing possible legislative options.

Cooperative Extension Service Funds--South Carolina State University--Audit Report No. 13011-2-At

OIG made a series of recommendations for South Carolina State University to improve its fiscal and administrative controls to ensure proper use of Cooperative Extension grant funds and recommended that CSREES require the university to make appropriate fiscal adjustments of $128,461 of Extension funds improperly used. OIG also recommended that CSREES either recover $2,069,128 expended for an incomplete office complex or require South Carolina State University to develop within 90 days a plan with a goal to complete the facility with non-Federal funds within 12 months. CSREES concurs with the recommendations in the audit report and will require South Carolina State University to develop a corrective action plan to implement the recommendations.

BIOTECHNOLOGY RISK ASSESSMENT

Mr. Skeen. Section 1668 of the Farm Bill requires that one percent of the biotech funds shall be set aside for risk assessment. Please provide a table for the record listing all USDA biotech funds, by agency, for fiscal years 1999, 2000, 2001.

(The information follows.)

UNITED STATES DEPARTMENT OF AGRICULTURE
Funds Available for Biotechnology Research

($000)

Agency	FY 1999	FY 2000	FY 2001
Cooperative State Research, Education, and Extension Service	$54,508	$54,559	$72,792
Agricultural Research Service	81,299	88,183	92,027
Forest Service	6,800	6,800	6,800
Total	142,607	149,542	171,619

BIOTECHNOLOGY RISK ASSESSMENT

Mr. Skeen. Describe how CSREES has used these funds in 1998 and 1999 and provide a few specific examples of grants and their accomplishments.

Response. This unique competitive grants program funds research investigating the effects of introducing genetically-modified organisms into the environment. The information derived from this research is made available to Federal regulatory agencies to assist them in making science-based decisions regarding these matters. As future advances in agricultural productivity depend more heavily on biotechnology, investigations into the ecological effects of using genetically-modified organisms are essential for identifying risks that may require management, and for considering public concerns about the use of this technology. At this time, USDA is the only Federal agency addressing these issues through competitive research grants. Since its inception in 1992, the program has funded 73 studies addressing questions relevant to the safe environmental release of genetically-modified plants, microorganisms, fungi, bacteria, viruses, arthropods, fish, birds, mammals, and other animals. Proposals submitted to the program are evaluated by a peer panel of scientists for scientific merit, qualifications of project personnel, adequacy of facilities, and relevance to both risk assessment and regulation of agricultural biotechnology.

In an ongoing effort to inform a wide cross-section of the scientific community about the program, links have been established from a number of scientific society websites to the program's website, where investigators can access application materials, as well as non-technical summaries of research previously funded by the program. Also available at this website are links to the CRIS system and to proceedings of biotechnology risk assessment symposia. The program funded a total of 14 new grants in 1998 and 1999. The funded studies will provide data on some of the most pressing problems facing Federal regulatory agencies today. For example, several of the funded projects will investigate the probability and consequences of pesticidal or herbicide-resistant transgene movement from crops to wild plant populations. A few will assess the ramifications of releasing transgenic organisms, such as insects, viruses and entomopathogenic fungi, for the control of insect pests. And others will address the risk of adaptation by insect pests to transgenic pest protected plants. Results are available for studies funded prior to 1998, and accomplishments from two studies are described: First, researchers at Iowa State University looked at the role of Tn916, a conjugal transposon, in exchange of genetic material between genetically engineered microbes and soil microbes. Early results show evidence of genetic exchange consistent with that expected of Tn916, and subsequent work will explore the factors affecting establishment of Tn916 in the soil. Results from this research will provide information essential for making regulatory decisions regarding the release of genetically-modified microbes for environmental cleanup and other uses. Second, researchers at the University of Oklahoma are investigating mechanisms for large-scale production of single-sex broodstock for use in risk assessments of genetically-modified fish species. Using reproductively limited fish is essential for conducting pre-release trials in an ecologically safe manner. The researchers have been successful in producing all-female progeny and are making good progress in producing all-male fish. The results of this research will ultimately aid in the safe evaluation of genetically-modified fish species, while minimizing concerns of ecological harm.

PLANT GENOME MAPPING

Mr. Skeen. For each of the following commodities, what is the status of their genome mapping: corn, wheat, soybeans, cotton, and peanuts?

Response. Genome mapping for the commodities mentioned has been accelerated because of additional funding for the National Plant Genome Initiative, a coordinated effort among Federal agencies to build a plant genome infrastructure that takes advantage of new technologies, databases, research tools, and genetic resources. During the past 18 months, many new projects have been supported to develop the biological research resources that are essential for elucidating the structure and organization of complex plant genomes. Collaborative structural genomics research projects are now underway for many widely grown plants, including the commodities mentioned. These projects have provided the research community with genetic maps, physical maps, DNA clone libraries, and mutant populations with specific genes tagged. For example, in wheat, DNA markers for resistance to *Fusarium* Head Blight, Russian wheat aphid, and Hessian fly, to name a few, have been identified thereby accelerating the development of superior U.S. varieties. In corn, soybean, cotton, and peanut, projects are underway to identify genetic markers for genes that control agriculturally-important traits in cultivated species. Once these genes are located to a particular chromosomal region, these DNA-based markers can be further used in marker-assisted selection in conventional breeding programs aimed at utilizing existing genetic diversity in the development of varieties with improved quality, greater yields, and higher levels of resistance to diseases, insects, and other adversities. New superior varieties will reduce growers production risk and increase profit, and reduce pesticide use.

Mr. Skeen. Please provide the amount of CSREES funds, by funding category, devoted to plant genome mapping for fiscal years 1999, 2000, and 2001.

Response. In 1999, the National Research Initiative--NRI--competitively awarded approximately $9 million for plant genome research. Proposals submitted in 2000 are currently under review. Funding for 2001 has not yet been appropriated, however, if the NRI is supported at the level proposed in the President's budget, another $3 million is designated for Plant Genomics research--including microbial genomics of plant pathogens. Plant genome mapping at USDA receives additional funding for Hatch, as well as special grants that are not included in the amount mentioned.

Mr. Skeen. What are some of the recent accomplishments in this area?

Response. Characterization of plant resistance genes is clearly of great potential importance for understanding how certain plants counter the predations of pathogens while other, related varieties succumb to them. Currently, a major impediment to the application of biotechnology is the dearth of characterized genes that might be used to create disease- resistance in plants, which would otherwise be susceptible to a pathogen. For this reason, the biotechnology industry has concentrated much of its early efforts on production of genetically-modified plants that express naturally occurring insecticides, such as the toxins from *Bacillus thuriengenesis*. Plant breeders have, of course, been constantly attempting to outsmart pathogens by more "classical" means. They produce new cultivars through out-crossing and selection. As a result, a large amount of genetic variation exists for resistance to various plant diseases and for other agronomic traits of importance to the grower. Such characteristics can be "mapped" through crossing different varieties and determining how closely the traits are linked to cloned DNA markers. Thus, a chromosomal position can be assigned to a so-called genetic map, even though the identity of the gene and of the protein it encodes is unknown.

A researcher at Cornell University has been able to map a series of genes in tomatoes that confer resistance to disease. These have included *Sw-5-*

-resistance to spotted wilt virus--, *Tm-2a*--resistance to tomato mosaic virus --,*Lv*--resistance to *Leveillula taurica*--, and *Mi*--resistance to root knot nematodes. The *Sw-5* gene was pinpointed to a region near the end of the long arm of chromosome 9. A cloned segment of DNA representing this chromosomal region was then identified and used as a probe to pull out candidate cDNA from virus-inoculated leaves. The candidate genes, in turn, were transformed into a susceptible tomato variety allowing the one that conferred resistance to be identified. This gene encoded a protein with the hallmark leucine-rich repeats that may be characteristic of many disease-resistance genes in plants. The researcher speculates that it may be part of a signaling cascade of reactions that allow defense mechanisms, such as local cell death that limits the spread of the infection, to be quickly mobilized. The same positional cloning procedure is being used to identify the other disease resistance genes earmarked for study.

Similar approaches are being used by other NRI investigators. For example, a researcher at Washington State University is studying resistance to barley stem rust. Barley is an important crop, providing raw material for the malting and brewing industry, but it has also become a useful genetic model for other members of the Triticeae. Two stem rust resistance genes, Rpg1 and rpg4, are being targeted. Over the last 50, years breeders have made use of the unusually durable Rpg1 phenotype to control the disease, but that approach is now faltering in response to a new stem rust pathotype. Fortunately, rpg4 provides resistance to the new fungal strain. The researcher has been able to map the chromosomal loci that house the two genes and is presently sequencing the cloned region that contains the rpg4 gene.

The type of research described above addresses three important issues for agriculture. First, it has demonstrated the power and utility of the map-based cloning approach for characterization of genes that control traits associated with improved agricultural productivity, whether through disease resistance, yield, or stress tolerance. The door is now open for the isolation of many hundreds of genes that, if targeted properly through either conventional breeding or transgenic procedures, can be used to remove some of the present limitations on crop plant productivity.

Second, the research has begun to shed light on the origins and molecular function of the resistance genes. The research at Cornell University has provided detailed information about a gene product that helps confer resistance to the spotted wilt virus. Importantly, it was demonstrated that *Sw-5* belongs in a super-family of structurally-related genes, whose members seem to control susceptibility to unrelated pathogens, including the bacterium *Pseudomonas syringae*. Novel family members and allelic variants, all presumably in the business of providing pathogen resistance, will be relatively easy to identify and clone by virtue of their signature sequences. Their positions in biochemical pathways, target end points, and triggering stimuli will be amenable to study through the new discipline of functional genomics.

The third outcome of the positional cloning approach to identifying genes is that molecular marker assays are now becoming available for a vast range of resistance genes in the tomato and other crops. Such markers will help plant breeders develop new cultivars that are naturally resistant to diseases, thereby resulting in higher yields and less use of pesticides.

Mr. Skeen. Please update the Committee on plant mapping projects you are doing in conjunction with the National Science Foundation and others.

Response. Recognizing the enormous scientific and economic potential for the future of U.S. biotechnological advances, a National Plant Genome

Initiative--NPGI--program was initiated in 1997 by the Office of Science and Technology Policy--OSTP--through the National Science and Technology Council--NST--, at the request of Congress. The OSTP established an interagency working group--IWG--on plant genome research, comprised of representatives from USDA, the National Science Foundation, the Department of Energy, the National Institutes of Health, OSTP, and the Office of Management and Budget. The IWG published a five-year plan and rationale for the NPGI in January 1998. The long-term goal of the initiative is to understand the structure and function of genes in plants important to agriculture, environmental management, energy, and health.

In the January 1998 publication, the IWG identified six goals that focused on building the requisite plant genome research infrastructure. Specific direction was given that the NPGI should be viewed as a long-term project, governed by a plan that will be updated periodically, based on assessment of success in reaching critical milestones and of the rapidly changing state of the art. The initial plan is being implemented by the participating agencies, which includes CSREES, to the extent possible under current funding levels.

Goal 1 is to complete the sequencing of the *Arabidopsis thaliana* genome and to participate in an international effort to sequence the entire Rice Genome. Goal 2 focuses on elucidating the structure and organization of genomes with the initial focus on developing physical maps and construction of Expressed Sequences--EST's--for 10-12 crop species as well as a few exotic species. Goal 3 involves identification of functions for gene sequences, including determining expression patterns for pathways or networks of genes under specific environmental conditions or during specific developmental stages. Goal 4 is to enhance technology development specifically designed to advance plant genomics. Goal 5 is to distribute and use genome data and resources among the scientific community. Goal 6 involves outreach and training in order to ensure rapid transfer of genomic information and technologies to their end users, and is an integral part of the overall plan for the NPGI.

ANIMAL GENOME

Mr. Skeen. What animal genome mapping projects are being funded with CSREES moneys?

Response. CSREES provides leadership for a national, coordinated program to map the genome of cattle, sheep, swine, poultry, and horses. This effort is organized as Regional Research Project, National Research Support Project #8--NRSP-8--under the National Animal Genome Research Program--NAGRP--and involves CSREES, ARS, State Agricultural Experiment Stations, and several other universities. There are six other regional projects that focus on genomics research and are closely related and complementary to NRSP-8. One of these is North Eastern Project #186: Genetic Maps of Aquaculture Species which is mapping the genomes of catfish, rainbow trout, tilapia, shrimp, and oysters. The CSREES National Research Initiative Competitive Grants Program--NRI--funds 21 investigator initiated projects awarded on a competitive basis which are doing genome mapping on the species already mentioned. Collectively, NAGRP and the NRI contributed to the identification of over 6,300, 800, 1,800 and 1,300 genetic markers for cattle, sheep, swine, and chickens, respectively.

Mr. Skeen. What is the total CSREES funding spent on animal mapping in fiscal year 1999, 2000 and 2001?

Response. CSREES Hatch Act formula funding contributed approximately $4.3 million per fiscal year to animal genome mapping, research coordination, and reporting. In fiscal year 1999, the NRI awarded grants for approximately $1.76 million for animal genome mapping and grants for approximately $2.2 million for animal genomic research. In total, $8.26 was provided for animal genomics in fiscal year 1999. As the appropriation for the NRI did not increase for fiscal year 2000, approximately the same funding levels would be maintained. The Initiative for Future Agriculture and Food Systems, authorized in fiscal 1998, may contribute up to up to $6.0 million in fiscal year 2000 for animal genome mapping and animal genomic research. If these programs continue at their current appropriations through fiscal year 2001, it is estimated that approximately $14.3 million would be available in CSREES for animal genome mapping and animal genomic research.

IR-4 AND PESTICIDE CLEARANCE

Mr. Skeen. Please provide for the record a table which shows total USDA funding for IR-4 work for fiscal years 1998 through 2001.

(The information follows.)

USDA IR-4 Program
($000)

USDA Agency	FY 1998	FY 1999	FY 2000	FY 2001
Cooperative State Research, Education, and Extension Service (CSREES):				
Hatch Act	$482	$501	$501	$501
Special Research Grants, IR-4 Minor Crop Pest Mgmt.	8,990	8,990	8,990	10,711
Subtotal, CSREES	9,472	9,491	9,491	11,212
Agricultural Research Service	2,093	2,068	2,067	2,067
Total, USDA	11,565	11,559	11,558	13,279

IR-4 AND PESTICIDE CLEARANCE

Mr. Skeen. How many registrations were completed in 1999, and what is the goal for fiscal year 2000?

Response. The IR-4 project obtained a total of 903 pesticide clearances in 1999, which included 313 food uses, 532 non-food uses, and 58 biopesticides. For fiscal year 2000, IR-4's goal is 1,050 pesticide clearances which is anticipated to be 500 food uses, 500 non-food uses, and 50 biopesticides.

Mr. Skeen. What is the current backlog of pesticide clearance requests?

Response. There are about 600 researchable projects which IR-4 could perform if there were additional funding.

Mr. Skeen. What financial assistance did you receive from private industry in fiscal year 1999, what do you anticipate for fiscal years 2000 and 2001?

Response. IR-4 received about $800,000 from private industry in 1999. For fiscal years 2000 and 2001, IR-4 is anticipating $500,000 per year, due to the continued restructuring and consolidation of the pesticide industry.

MINOR USE ANIMAL DRUGS

Mr. Skeen. What is the backlog on minor use animal drugs and how many were registered in 1999?

Response. The Minor Use Animal Drug Program--NRSP-7--continues to receive several new requests for drug approval each year. Since the beginning of the program, 302 requests have been received from animal producers, universities, and veterinarians for the development of data in support of the filing of a New Animal Drug Approval. Currently, data representing 28 Public Master Files, involving 14 animal species, have been published in the Federal Register since the beginning of the program providing approval for drug use. The Public Master Files publication enables pharmaceutical companies to extend their label claims to minor species by referencing the published Public Master Files in their New Animal Drug Approval filing. Furthermore, these data also enter the public domain as presentations to professional groups, publication of peer-reviewed articles, and inclusion in the Food Animal Residue Avoidance Databank--FARAD. Working cooperatively with many universities, other Federal agencies, and numerous pharmaceutical companies, 24 research projects are now active and will be continued through 2000 to establish data for drug approvals. The procedure for obtaining drug approval requires four separate studies per drug--human safety, target animal safety, environmental safety, and efficacy.

Program funding has been available for only about one out of every five requests submitted to the Minor Use Animal Drug Program. Of the remaining requests, approximately 75 percent are potential projects for the minor use animal drug program. Limiting factors include the lack of an economic incentive for a pharmaceutical company to sponsor the research, that insufficient funds are available for research leading to the unavailability of research investigators, and the fact that the drug is not approved in a major species. The scope of the program also has broadened due to increased emphases on aquatic species, the classification of sheep as a minor species, and the increasing needs of the game bird industry and various expanding industries. The importance of environmental assessment, residue withdrawals,

and occupational safety have increasingly been given more attention during the approval process to help assure consumer protection.

In 1999, two Public Master Files were published in the Federal Register indicating approval by the Center for Veterinary Medicine, Food and Drug Administration, and three Public Master Files were submitted for publication. Sulfadimethoxine/ormetoprim for coccidiosis in Chukar partridges and amoxicillin for bacterial pneumonia in sheep were approved by the Food and Drug Administration based on the data submitted by NRSP-7. Those Public Master Files submitted included oxytetracycline of otolith marking of fish by immersion, ceftiofur for bacterial pneumonia in goats, and ivermectin pour-on for hypodemosis in American bison.

Mr. Skeen. What did you accomplish in fiscal year 1999 and what is the goal for fiscal years 2000 and 2001?

Response. The regional coordinators and investigators expect to complete the research for several additional animal drug studies in the next two years. It is anticipated that the research in progress will result in four new minor use animal drug approvals in 2000 and 2001. Already in 2000, the Public Master File for albendazole is complete and ready for publication in the Federal Register. The demands on the program continue to grow due to increased needs by the sheep, goat, aquaculture, and game bird industries as well as for additional animal species including non-food species. There is increased pressure on the Minor Use Animal Drug program to include the development of production drugs such as spawning hormones for certain aquaculture species and reproductive hormones for the sheep industry. Increased costs also are being incurred due to the need for research laboratories to comply with Federal requirements for Good Laboratory Practices. More expensive analytical techniques and sophisticated research are required especially to assure human and target animal safety.

In the next few months, it is anticipated that the Food and Drug Administration will finalize a Minor Use Guidance Document for publication in the Federal Register. In addition, the Animal Drug Availability Act for Minor Use and Minor Species includes proposals to increase the interest of the pharmaceutical industry to participate in obtaining approval of drugs for minor species and uses by removing certain disincentives.

Mr. Skeen. What financial assistance did you receive from private industry in fiscal year 1999, and what do you anticipate in fiscal years 2000 and 2001?

Response. The Minor Use Animal Drug Program continues to benefit from the pharmaceutical companies that have cooperated as sponsors for animal drug research projects for this program. The major contribution to Minor Use Animal Drug Program is the cost borne by the pharmaceutical industry for the registration of drugs for a major species, estimated at approximately $20 million per drug. Proprietary research data from these registrations are made available to the Minor Use Animal Drug Program resulting in drug approval for use in a minor species, at a program cost of $200,000 or less per drug. Thus, the pharmaceutical industry provides the major portion of the cost of attaining drug approval.

The drug manufacturers also contribute to this program by donating quantities of the drug for research purposes, and often providing analytical support for residue studies. The animal industries, together with the pharmaceutical industries, routinely contribute research animals and other in-kind services to the Program. In several instances, industry provides direct financial support to the program, however, most of the industries are quite

small and their ability to provide support is limited. Another significant contribution to the program is the in-kind contributions from universities in terms of facilities, equipment, salaries for researchers, animal caretakers, and general support such as utilities and publication costs. Funding from non-federal sources includes state appropriations, direct contributions from private industry, and endowments. The total support from non-Federal sources is much greater than the Federal funding provided by Minor Use Animal Drug Program.

ADVANCED SPATIAL TECH, MISSISSIPPI (Precision Agriculture)

Mr. Skeen. Please provide a description of the research that has been funded under the Advanced Spatial Technology, Mississippi grant.

Response. This research will evaluate the use of site-specific technology and assess the economics of its application. Cultural practices will be studied and integrated into management system using-site specific technology to monitor yield and variable rate application. This project will expand on work conducted under the Special Technology Special Research Grant funded at $350,000 in fiscal year 1997 and $600,000 in 1998.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to provide farmers with unbiased information on the application and economics of site specific technologies for cotton production in the mid-south.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to evaluate site specific technologies and develop recommendations for management decisions related to fertilization, pest control, and other cultural practices.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997 and the appropriation for fiscal year 1997 was $350,000, for fiscal year 1998 it was $600,000, for 1999 it was $1,000,000 and for fiscal year 2000 $1,000,000 for a total of $2,950,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds provided for this grant are $620,300 in 1998, and $942,000 in 1999. These funds are State appropriations that support the salaries of scientists and their support staff.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted on various Mississippi Agricultural Experiment Station branch locations around the state.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigators anticipated the completion date for the original objective to be in fiscal year 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was subject to an initial evaluation at its start in fiscal year 1998. The last evaluation was in July of 1999. Progress so far has resulted in useful information already being applied at the farm level.

AFLATOXIN RESEARCH, ILLINOIS

Mr. Skeen. Please provide a description of the research that has been conducted under the Aflatoxin Research, Illinois grant.

Response. This research is focused on development of strains of corn which will be highly resistant to infection with *Aspergillus flavus* and the production of aflatoxin under field conditions. Transfer of genetic material from resistant strains to other, usable, inbred strains of corn is underway and these new strains are being field tested to determine level of resistance to fungal infection.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for the research?

Response. There is much national concern about the role of aflatoxins as carcinogens in the human population. The aflatoxin material is also toxic to animals and humans. The presence of the fungus in corn results in a lower value for the crop and the possible rejection of the corn by the grain elevator owners. Aflatoxin contamination continues to be a serious problem in the southern and southeastern United States, with additional outbreaks also occurring during severe drought conditions in the upper mid-west and other areas during the past few years.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research was the reduction of infestation of corn with *Aspergillus flavus* and the consequent reduction of aflatoxin in the corn produced. The researchers have produced strains with resistance genes for both prevention of infection with *A. flavus* as well as the production of the aflatoxin itself. Field trials have been in progress to determine effectiveness of these resistance factors under normal growing conditions when exposed to the fungus. The work has now progressed to the stage where it seems likely that more than one gene will have to be transferred to produce strong resistance to the Aspergillus infection and production of aflatoxin.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1990, $87,000; fiscal year 1991, $131,000; fiscal years 1992-1993, $134,000 per year; fiscal year 1994, $126,000; fiscal years 1995 through 2000, $113,000 per year. A total of $1,290,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds by fiscal year?

Response. The non-federal funds have been from state appropriated dollars in the form of principal investigator and technical salaries, equipment usage, and experimental plot expenses. These have been at the level of $130,000 for fiscal years 1997 and 1998, and $24,747 for fiscal year 1999.

Mr. Skeen. Where is this work being performed?

Response. The research is being performed in the Department of Crop Sciences at the University of Illinois.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives was 1995, but the project was revised last year to continue to fiscal year 2002. The primary reason for the extension of the work is that there appear to be multiple resistance genes which are necessary to prevent both the infection with the fungus and the synthesis of the aflatoxin compound. The investigators are very optimistic about the future success of this approach. This work was discussed at a meeting of Multi-State Research Project NC-129 on January 25-26, 1999 in New Orleans and the Principal Investigators are members of the Technical Committee of this project.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was evaluated on March 10, 2000. The investigators have made good progress on this project. They presently have identified that the key issue is to insert genes coding for two enzymes, chitinase and B glucanase, which will attack the fungus cell wall. They have many options on how to enhance the resistance level in the corn and several genetic transformations that can be tested. The resistance of plants to Aspergillus flavus does not carry over to resistance to Fusarium monoiliforme. A major impediment now is the ability to do field trials of sufficient scale to test the new varieties and the variation in environmental conditions which often results in a growing season with a low incidence of aflatoxin production even in susceptible plants. The research team indicated that additional funds would be required in order to accelerate their current rate of progress.

AGRICULTURAL DIVERSIFICATION AND SPECIALTY CROPS GRANT

Mr. Skeen. Please provide a description of the research that has been funded under the Agricultural Diversification and Specialty Crops grant.

Response. There are numerous outcomes from this grant over the past year: A book on plants for Hawaiian lei material is in the publications office for final work-up.

Video conferences in June 1998 and September 1998 were held to discuss issues relating to food safety on the farm, and included USDA and FDA personnel in Washington and over 90 participants at each session. A food safety website was developed (http://www.hawaiiag.org/foodsafe/foodsaf.htm) and an article was written for the Hawaii Farm Bureau Federation newsletter covering on-farm food safety issues.

In 1999 the project co-chaired a Hawaii transportation industry education task force and developed and wrote with 18 co-authors the "Preflight Checklist for Shipping Your Quality Hawaii Agricultural Product."

The project worked with 32 co-authors to produce the handbook "Hawaiian Islands Air Cargo Resource Book 1999-2000," which lists information on 130 service providers and valuable information on how to ship a product in the most efficient ways.

A talk was given at the 2nd Annual Hawaii Air Cargo Symposium in September 1999 on the progress of the transportation education task force.

The project developed a fact sheet called, "Estimating the per-pound cost of a dried or condensed food based on process yield and farm-gate price," that helps entrepreneurs calculate processing loss and potential profits from food dehydration.

Three tools for entrepreneurs will be completed in the first quarter of 2000: An extensive fact sheet on the "Costs and Considerations for Establishing an Entrepreneurial Community or Shared Use or Test Kitchen Incubator," a poster to help food product entrepreneurs quickly calculate their cost of production; and a fact sheet on the cost of establishing incubator kitchens for food processing entrepreneurs, including an emphasis on safe food processing.

The project is advising the Hawaiian Commercial and Sugar Company on the possibility of starting a large-scale white taro production and processing operation in high pressure minimal processing for pineapple and other tropical fruits, the cause of premature fading of pineapple slices has been determined and the temperature, pressure and time relationship has been identified to achieve sterility.

The project is collecting data and information on cultural practices for kava, a nutraceutical. Projects with other funding sources have been facilitated on the major disease of kava in Hawaii (cucumber mosaic virus dieback) and on the biosynthesis of kava lactones in a bioreactor. Cooperation with the private sector is being facilitated on the production and processing of stevia, a natural sweetener.

Mr. Skeen. According to the research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. Hawaii's economy continues to lag behind national averages where growth is concerned. The various projects under the umbrella of the Diversified Agriculture and Specialty Crop grant rely on information research to build decision-making tools. These tools help entrepreneurs make more informed decisions. When entrepreneurs make better decisions they have a higher chance of making a profit in business. The decision-making tools are being used in the Hawaii, the Pacific, and on the mainland.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the original proposal was to screen potential food and non-food crops for commercial development in Hawaii and then make earnest attempts to work with willing and able entrepreneurs to move the results of research to the private sector. The lei manual, in final preparation, will provide entrepreneurs with information on how to grow plants that they never had information about, and they will also be armed with a cost of production framework that is specific to nursery production. While the University of Hawaii continues to screen crops to help entrepreneurs pick the best ones for production and the market place, there are few decision making tools that can help entrepreneurs take their products more successfully to market. Thus, there is an emphasis on information tools such as a transportation handbook and a cost of production poster. To help farmers prepare for increased food safety scrutiny, the University of Hawaii is working with Hawaii State agencies and other non-profits to reach out to farmers with critical information.

Mr. Skeen. How long has this work been underway and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows, fiscal years 1988-1989, $156,000 per year; fiscal years 1990-1993, $154,000 per year; fiscal year 1994, $145,000; and fiscal years 1995-1999, $131,000 per year; and fiscal year 2000, $131,000. A total of $1,859,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The University of Hawaii provides in-kind support in the form of laboratory and office facilities, equipment and equipment maintenance, and administrative support services: $68,503 in fiscal year 1992; $75,165 in fiscal year 1993; and approximately $75,000/year in fiscal years 1994-96, approximately $20,000/year in fiscal years 1997-2000. Funds are also being leveraged from other private sector, state and federal sources for the development of nutraceuticals.

Nearly $50,000 of in-kind support has come from private sector and state partners, including $8,000 from the Office of Hawaiian Affairs and $30,000 from the private sector on the high pressure minimal processing project. The value of community time on all the publications written in the past year or so is also well over $75,000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of Hawaii's College of Tropical Agriculture and Human Resources on the island of Oahu, and other Hawaiian islands as necessary.

Mr. Skeen. What is the anticipated completion date for the original objectives of this project? Have those objectives been met? What is the anticipated completion date for additional or related objectives?

Response. All taro work is completed. Lei plant manual will be out in the first quarter of 2000. Work is just starting on transportation and food safety issues and will continue through 2002. Work on business related information tools will continue through 2002. Work continues on high pressure processing of tropical fruits and will continue through 2002. Work on nutraceuticals, particularly cultural practices and disease management of kava and stevia, is continuing through 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Project PI's are in regular contact with project manager at USDA-CSREES. The USDA manager has seen outcomes on a regular basis and visits the project at least once per year to evaluate progress and help plan subsequent or related project objectives.

AGRICULTURAL DIVERSITY/RED RIVER, MN AND ND

Mr. Skeen. Please provide a description of the research that has been funded under the Agricultural Diversity Grant.

Response. This multi-year, multi-phase project will have six specific components. They are: 1) vegetable growing research - especially field and glasshouse related research, 2) vegetable collection and storage research and/or related storage or distribution business development, 3) development of processing industries for the fresh market or research related to the fresh

products for market, 4) development of marketing and/or supply associations among vegetable producers, 5) development of processing industries for the ready-to-eat salad market or research related to ready-to-eat products, and 6) development of processing industries for the frozen vegetable products market or research related to frozen products. This first phase of this multi-phase project will concentrate its industry development and research activities in three areas: vegetable growing research - especially field and glasshouse related research, development of marketing and/or supply associations among vegetable producers, and development of processing industries for the ready-to-eat salad market or research related to ready-to-eat products. The second phase of this multi-phase project will concentrate its activities in four areas: continued research on vegetable production, including commercial greenhouse production, field production using Missouri River water for irrigation; development of markets for fresh product; preparation of a business plan for a ready-to-eat delicatessen salad processing facility in the region; and analysis of the potential for adding higher value complementary crops to the rotation mix in vegetable producing areas.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Initially the growing of vegetables in the region was driven by an opportunity to meet increasing consumer demand for fresh vegetables and concerns over both the cost of water and the environmental impacts of the use of chemicals in the traditional vegetable producing regions of the southern United States. This industry currently raises three crops of vegetables a year. This requires extensive irrigation in the hot summer months. Population growth and increased domestic and industrial demands for water have created significant pressures to shift water usage away from agriculture and toward other domestic and industrial needs. Additionally, use of chemicals to fight soil bacteria has raised environmental concerns in these states. These issues created a need to identify other regions to produce vegetables, especially in the summer months. The northern plains states of Minnesota, North Dakota and South Dakota have been identified as one area that could meet this need. In addition, the opportunity to add a high-value crop to the rotation cycle for northern Great Plains farmers can help to decrease their dependence upon program crops. The shift in cropping patterns can have a positive effect on farm income and lessen the need for outside or federal financial assistance. Interest in the potential for adding higher value crop to the rotation cycle, including vegetables, has increased significantly in the past year due to the poor farm economy. Research on the potential for adding new crops to the region's production base could help stabilize the farm economy in the region and lessen the need for outside financial assistance to farmers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The project objectives include: 1) Conduct three replicated field trials on growing of carrots; 2) Continue study of vegetable growing techniques in Europe and continue negotiations with vegetable growing research facilities/laboratories in Europe to transfer growing knowledge to the region; 3) Review current and future market opportunities for further development of the industry and identify strategies and partners for pursuing these opportunities and take appropriate organizing steps; 4) Develop and maintain a web page for this vegetable industry project; 5) Conduct market research for establishment of a ready-to-eat delicatessen salad processing facility in the region; 6) Conduct market research for establishment of a ready-to-eat fresh-bagged salad processing facility in the region; 7) Continue

business development planning for establishment of a ready-to-eat delicatessen salad processing facility in the region; and, 8) Continue business development planning for establishment of a ready-to-eat fresh-bagged salad processing facility in the region. Funding for this project was received July 1, 1998 at which time work on the project began. The Red River Trade Council Vegetable Industry Task Force has a number of specific activities currently underway to help develop regional vegetable processing markets for vegetable production.

In the area of Deli-salad production the Vegetable Task Force continues to work on transferring state-of-the-art deli-salad and upstream processing technology that produces long-shelf-life, preservative-free wet salads to the region. Over the past several years, researchers have conducted market opportunity studies, taste-test evaluation, and are in the process of business planning and coordinating additional partners to capitalize construction of a new processing facilities in the region. The work conducted in this process has identified specific technology that is used by up-stream suppliers of a deli-salad company. This technology produces the highest quality pre-processed vegetables that can be stored at room temperature for up to 90 days. This technology allows several different vegetables to be processed using the same equipment and requires little time to switch to different vegetables. A facility like this in the region that is capable of processing several different vegetables is critical to allow production and market diversification.

Significant research has been conducted to understand the market opportunities available in premium dehydrated products, especially dehydrated vegetables. This research has identified several different vegetables that provide opportunities depending on the processing yield that our products would provide. Initial vegetable production trials were conducted in the summer of 1999. Results from these trials were positive and additional research will be conducted to evaluate additional varieties and production and storage practices in the summer of 2000.

Greenhouse Production issues are being examined by the Red River Trade Council which is developing a greenhouse task force to evaluate the potential for controlled environment production in the region. The Red River Trade Council has worked with extension and industry in the Netherlands to understand issues facing the development of this industry in the region. The Greenhouse Task Force is working to identify markets and feasibility for controlled environment production to provide year-round supply of high-quality vegetables to supply processed and fresh markets.

Market research conducted on high value products from alfalfa indicated that there is a potential for development of an alfalfa processing facility in our region. Additional work to coordinate research, identify potential industrial partners, and further evaluate the market feasibility is continuing.

Significant effort is being conducted to develop cooperative marketing systems that allow production to be focused on specific-quality traits. The Red River Trade Council is working to facilitate development of farmer alliances or next generation cooperatives to supply specific-quality products to the marketplace.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 with appropriations for fiscal year 1998, 1999 and 2000 of $250,000 each year for a total of $750,000 appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Efforts have been made to secure non-federal funding from individual states and commodity groups. To date the states of North Dakota and Minnesota have been a source of approximately $65,000.

Mr. Skeen. Where is the work being carried out?

Response. The work is being carried out in Minnesota, North Dakota and South Dakota.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Progress is being made on the original objectives. It is expected that this will be a multi-year, multi-phase project. Work is expected to continue until June 30, 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was evaluated by review of the proposal and is subject to annual project reports. An on-site review is scheduled for June of 2000.

AG-BASED INDUSTRIAL LUBRICANTS RESEARCH PROGRAM, IOWA

Mr. Skeen. Please provide a description of the research that has been funded under the agricultural-based industrial lubricants research program grant.

Response. This project is a continuation of nine years of activity conducted to target specific applications, establish baseline performance data, develop formulations of additives and chemical modifications, administer laboratory and field tests, characterize, and build relationships for commercialization of industrial lubricants derived from U.S. grown vegetable-based oils. Baseline performance data will be compiled to establish fatty acid compositions, will serve as guide to develop strategies for genetic modifications, additive development, establish standards relative to toxicity and biodegradability, and characterize compatibility with specific metallic and non-metallic components. The grant has been peer reviewed internally at the University of Northern Iowa.

Mr. Skeen. According to the research proposal, or the principal research, what is the national, regional, or local need for this research?

Response. Primary local and regional need is related to expanding value-added applications of agricultural commodities in order to stimulate increased demand and raise crop prices paid to farmers. On a national level, the need is to provide renewable, safer, more environmentally sound alternatives to petroleum based industrial lubricants. The principal investigator believes this research to be of local, regional and national importance. Furthermore, there is a belief that there are international possibilities for the use of

genetically modified soybean-based lubricants. Premium quality lubricants made of genetically modified domestic crops present a potential for use in a no-food area, i.e. industrial lubricants.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the program was sponsored by non-federal funding to develop a soybean based hydraulic oil which was introduced to market in July of 1997, marketed by AGRI Industries of West Des Moines, Iowa as BioSOY hydraulic fluid. As of January 1999, and with the consensus of Agri Industries, the original license was transferred to West Central Cooperative of Ralston, Iowa, which is in a better position to market the product. Field testing of two grease formulations and a dielectric transformer coolant has begun, as well as development of a two-cycle engine lubricant, and bar and chain oil. A large volume of technical data has been compiled specific to crop based oil and lubricants. This program has identified and has begun servicing a broad array of market development requirements, including demonstrating specific performance features, expanding awareness, and supporting government purchase initiatives. In September 1999, two new soybean-based lubricants were licensed to West Central Coop and are now commercial products. Those were a chain saw bar oil called SoyLINK and a fifth wheel grease call SoyTRUK.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Federal funding for this project began with a 1998 appropriation of $200,000. Fiscal years 1999 and 2000 appropriations are $250,000 each year for a total of $700,000 appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Since 1992, this research program has received cash grants from the Iowa Soybean Promotion Board, Carver Scientific Research Initiatives, in addition to several in-kind donations from industry to develop and coordinate commercialization of what has since become BioSOY hydraulic oil. Beginning in 1995, the state of Iowa began to support the program through its Wallace Technology Transfer Foundation. Beginning in 1996, state funding was provided by legislative appropriation through the Iowa Department of Economic Development. Additional funding has been provided by the Iowa Department of Agriculture and Land Stewardship. In fiscal year 1998 $150,000 was appropriated through the Iowa Department of Economic Development, $50,000 from the Iowa Soybean Promotion Board, $25,000 from Iowa Department of Agriculture and Land Stewardship, $32,500 from John Deere, and other awards and service revenues totaling approximately $60,000. State funding for fiscal year 2000 in amount of $400,000 has been requested through direct appropriation to the university.

Mr. Skeen. Where is the work being carried out?

Response. Laboratory and literature studies are being carried out primarily at the Ag-based Industrial Lubricants Research Program facility in Waverly, Iowa, with minor portions of activity being conducted on the campus of the University of Northern Iowa in Cedar Falls, Iowa and the laboratories of various industrial affiliates located throughout the state and country. Field tests are being conducted at Sandia National Laboratories, U.S. Department of Army test sites, some municipalities, and in industrial

equipment located throughout the nation. A short line Iowa-based railroad and a class I railroad have been testing soybean-based rail/flange grease with success and a new lubricant for railroad use is expected to be commercialized this year.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives have been met, in part, with the optimization, demonstration, and commercialization of the soy-based hydraulic fluid. Data collection, additive and modification research, characterization, and supplier development objectives of the first year are ongoing. The development of the dielectric transformer coolant is an added objective and has been expedited through to field testing. Activities to expand public awareness and support government purchase initiatives have been added to the original objectives. Field testing of some products is expected to be completed within a year and additional lubricant applications are anticipated to be targeted for development and field testing within two years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The cognizant staff scientist reviews quarterly reports and has determined that this research is technically sound and directly addresses the goal of the agency to expand markets for agricultural materials.

AGRICULTURE TELECOMMUNICATIONS, NY

Mr. Skeen. Please provide a description of the research that has been funded under this grant.

Response. This program encourages the development and utilization of an agricultural communications network to facilitate and strengthen agricultural extension, resident education, and research, and domestic and international marketing of United States commodities and products through a partnership between eligible institutions and the Department of Agriculture.

Mr. Skeen. According to the research proposal or the principal researcher, what is the national, regional, or local need for this research?

Response. The following needs will be addressed by this program:

--Make optimal use of available resources for agricultural extension, resident education, and research by sharing resources between participating institutions;
--Improve the competitive position of United States agriculture in international markets by disseminating information to producers, processors, and researchers;
--Train students for careers in agriculture, natural resource management, environmental science, human sciences, and the food industries;
--Facilitate interaction among leading agricultural scientists;
--Enhance the ability of United States agriculture to respond to environmental and food safety concerns; and
--Identify new uses for farm commodities and increase the demand for United States agricultural products in both domestic and foreign markets.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this program is to encourage the development and utilization of an agricultural communications network to facilitate and strengthen agricultural extension, resident education, and research, and domestic and international marketing of United States commodities and products through a partnership between eligible institutions and the Department of Agriculture. Various educational, extension, and technology transfer projects have been funded through the program in fulfillment of this goal.

Mr. Skeen. How long has this work been underway and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. The project began in fiscal year 2000, and is funded for $425,000.

Mr. Skeen. What is the source and amount of non-Federal funds provided, by fiscal year?

Response. Prior to fiscal year 2000 it was a one hundred percent match of funds from non-Federal sources. However, beginning in fiscal year 2000, it became a special research grant and does not require a match of funds from non-federal sources.

Mr. Skeen. Where is this work being carried out?

Response. Cornell University will award grants competitively throughout the United States.

Mr. Skeen. When do the principal researchers carrying out this work anticipate that the work will be completed?

Response. Projects funded through this grant are two-year projects.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Due to the changing nature of technology and the continuing need for information in the agricultural community, the objectives of this project cannot be considered of a terminal nature. Individual projects being funded address ongoing needs for information dissemination and technology transfer. As each project is completed the results are evaluated to determine the success of meeting the program's objectives.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted?

Response. The agency evaluates this project each year via a report from institutions funded. In summary, the following highlight the programs funded:

- - Dollars provided by the Agricultural Telecommunications Program resulted in the Tri-State Agricultural Distance Delivery Alliance (TADDA), which includes Washington State University, Oregon State University, and the University of Idaho. Six courses reach learners at any location, and nearly fifty more are in the development stage.

- - Texas A&M University collaborated with Utah State University and the University of Kentucky to develop a nationally recognized program in international agribusiness marketing. It reaches food marketing firms, food processors, and other extension audiences.

- - New Mexico State University successfully implemented a multimedia program called "Marketing from a Rural Environment," which focuses on place-bound minority learners.

- - The University of Arizona developed a comprehensive and dynamic Internet-based resource on rangeland management.

- - Mississippi State University extended the reach of the Web to all state and county offices.

- - Ohio State University developed an internationally recognized system for quickly targeting and accessing appropriate horticulture information.

AGRICULTURE WATER USAGE, GA

Mr. Skeen. Please provide a description of the research that has been funded under the Agriculture Water Usage, Georgia grant.

Response. The project will determine agricultural water use in Georgia using a 2 percent statistical sample of water sources. Equipment has been purchased and personnel hired to conduct the project.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Water has become a major issue in the southeast. The tri-state water "issue" between Florida, Georgia, and Alabama is seeking to allocate interstate waters in the primary river basins which begin in the Atlanta area. These allocation formulas are completed and ready for use. The salt water intrusion problem associated with coastal Georgia and South Carolina is also a major issue. Both these problems suffer from the lack of data on agricultural water use across the state. This program seeks to develop a monitoring and modeling strategy to determine how much water is used by agricultural irrigation. The program is designed to begin with Georgia and then allow expansion into neighboring states for a better estimate of agricultural water use.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The project has begun by hiring of strategic personnel for the monitoring program, and development of the equipment and the data base to be used for obtaining volunteers for the monitoring phase. This integrated project will involve the development of computer based models to take a monitoring sample and extrapolate that information for the entire state.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999. The appropriation for fiscal year 1999 and 2000 is $300,000 giving a total of $600,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The state of Georgia through the Georgia Department of Natural Resources, Environmental Protection Division has appropriated $289,000 for fiscal year 1998-1999 and is expected to appropriate $250,000 per year for an additional 4 years to help support this project.

Mr. Skeen. Where is the work being carried out?

Response. Research will be conducted from the University of Georgia, College of Agricultural and Environmental Sciences. The primary coordination of the program will be centered in the Biological and Agricultural Engineering Unit at Tifton, Georgia, but the program will involve input from personnel in Griffin and Athens, and researchers outside the University of Georgia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This project, within the overall agricultural water use program, is anticipated to be completed within the original 5-year time frame. Since this project is new, objectives have not been completed to date.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project is new and has not been through an agency evaluation; however, the investigators prepare quarterly reports for the State. The procedures used to conduct the project have been peer reviewed and all publications developed by the project will be peer reviewed. One product has been produced, "Irrigation Conservation Practices for the Southeast U.S.", a 60-page report.

ALLIANCE FOR FOOD PROTECTION, NE, GA

Mr. Skeen. Please provide a description of the research that has been funded under the Alliance for Food Protection grant.

Response. The fiscal year 2000 appropriation supports the continuation of a collaborative alliance between the University of Georgia Center for Food Safety and Quality Enhancement and the University of Nebraska Department of Food Science and Technology. Fiscal year 1999 funds supported research at the University of Nebraska on the detection, identification and characterization of food allergens, the effects of processing on peanut allergens, and investigation of the efficacy of using various types of thermal processes to reduce or destroy the toxicity and mutagenicity of certain *Fusarium* metabolites in corn and corn products. Research at the University of Georgia is directed toward determining the foodborne significance of *Helicobacter pylori*, developing a competitive exclusion bacterial culture to reduce carriage of *Camplylobacter jejuni* in poultry, developing methods to differentiate Shiga toxin-producing *E.coli* that are pathogenic for humans from nonpathogenic strains, and developing methods to detect parasites in produce.
Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the proposed research addresses emerging issues in food safety which have national, regional and local significance. Specifically, research will address bacterial pathogens that can cause ulcers, cancer and diarrheal illness, toxic fungal metabolites in corn products, and allergens in foods that cause serious reactions,

including death, in sensitive people. These emerging issues affect consumers, the food industry, and food producers at all levels, national, state, and local.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The original goal of this research was to: 1) facilitate the development and modification of food processing and preservation technologies to enhance the microbiological and chemical safety of products as they reach the consumer and 2) develop new rapid and sensitive techniques for detecting pathogens and their toxins as well as toxic chemicals and allergens in foods. The University of Nebraska developed assays for detection of peanut, milk, egg, and almond residues in processed foods, produced high-quality antibodies for these assays, identified a soybean allergen and two sunflower seed allergens, discovered clues as to the reason why Brazil nuts cause severe allergic reactions, discovered that certain types of *Fusarium* fungi do not produce mutagenic substances, developed a simple liquid chromatographic procedure for determination of moniliformin toxin, found that the corn flake manufacturing process can reduce levels of fungal toxins such as aflatoxin and fumonisins, and also found that low levels of carcinogenic aflatoxins in corn grits might be reduced to less than regulatory actions levels by the corn flake manufacturing process.The University of Georgia developed methods to culture *Helicobacter pylori* and to detect the pathogen in water by advanced genetic-based techniques. It was found that *Arcobacter* is easily killed by heat treatment, exposure of E.coli 0157:H7 to acid increases the bacterium's tolerance to heat and that the pathogen could survive for many weeks in refrigerated dry foods, and it was determined that extrusion cooking can greatly reduce allergens in peanuts.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1996, and $300,000 was appropriated in each fiscal year 1996 through 2000, for a total appropriation of $1,500,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The non-federal funds and sources provided for this grant were $117,000 state funds and $250,000 industry and miscellaneous in fiscal year 1996 and were estimated to be a minimum of $111,000 state funds and $305,000 industry and miscellaneous in fiscal year 1997. In fiscal year 1998, $70,000 came from state funds and $295,000 from the food processing industry and miscellaneous funds. The amount of state funds provided in fiscal year 1999 was $30,000 and $100,000 were provided by the industry. A minimum of $25,000 state funds and $25,000 industry funds will be provided in fiscal year 2000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of Georgia Center for Food Safety and Quality Enhancement in Griffin, Georgia and at the University of Nebraska Department of Food Science and Technology in Lincoln, Nebraska.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The original objectives have not yet been met. The researchers anticipate that work will be completed on the original objectives in 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposals submitted in support of the project on an annual basis. A review of the proposal from the University of Nebraska was conducted on March 29, 1999, and good progress was demonstrated on the objectives undertaken in 1998. For example, research performed at Nebraska has shown that extrusion cooking reduces allergenicity of peanut flour. At the University of Georgia a review was conducted on April 14, 1999, and good progress was demonstrated on the objectives undertaken in 1998. Researchers there have developed a medium to enhance the growth of gastric ulcer-causing bacteria.

ALTERNATIVE CROPS, NORTH DAKOTA

Mr. Skeen. Please provide a description of the research that has been funded under the Alternative Crops, North Dakota program.

Response. The alternative crops project has two main thrusts, development and utilization of alternative or novel crops and utilization of traditional crops. The goals of the project are to diversify income at the farm gate, reduce reliance on monoculture to help alleviate pest problems, while providing new agricultural and industrial products to society. Some of the new areas under investigation include feeding of co-products to livestock; development of white wheat as an alternative crop, production of certified dried bean seed, and borage. Previous work continues with oilseed crops such as crambe, rapeseed and safflower as a renewable supply of industrial oil, products from food crops for novel new uses in paints, coatings, food ingredients, and the development of new biochemical and enzymatic processes to refine oils for industrial uses. The projects funded in this appropriation are evaluated by a peer-panel chosen by the Associate Dean of Research at North Dakota State University. The internal peer review was conducted on the following criteria: 1) probability and extent of generating value-added agricultural products, 2) technical and financial feasibility, 3) scientific merit, 4) innovation, 5) probability of rapid commercialization and 6) interdisciplinary research efforts.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Regionally, the temperate areas of the Midwest have the potential to grow a great number of different crops but are in need of publicly- sponsored research efforts to reveal the most practical, efficient, and economical crops and products to pursue. Growers in surrounding states are currently utilizing the information generated by research conducted through this grant. The principal researcher believes that nationally, developing new crops and new markets for agricultural products is critical for both environmental and economic reasons. Enhanced biodiversity that comes from the successful commercialization of new crops aids farmers in dealing with pests and reducing the dependency upon pesticides. New markets are needed to provide more economic stability for agricultural products, especially as Federal price supports are gradually withdrawn.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was and still is to introduce, evaluate and test new crops which will broaden the economic diversity of crops grown in North Dakota. The primary emphasis is to find new crops, new uses and create value added products, such as crambe, lupin, canola, safflower, cool-season grain legumes, buckwheat, amaranth, field pea production and utilization, transgenic sugar beets to produce levan, utilization and processing lupin flower, confectionery sunflower production, growing and marketing of carrots, crop-derived red food dye and high quality pectin as food ingredients, innovative biochemical means of splitting crop oils, and other new uses of oilseed crops, development of markets for new crops as livestock and fish feeds. These efforts have forged a strong link with the private sector, and successfully spawned several crops and products into profitable private sector businesses

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Appropriations by fiscal year are as follows: 1990, $494,000; 1991, $497,000; 1992 and 1993, $700,000 per year; 1994, $658,000; 1995, $592,000; and in 1996 through 2000, $550,000 per year. A total of $6,391,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. In fiscal year 1991, $10,170 was provided by state appropriations. In fiscal year 1992, $29,158, was also provided by state appropriations and self-generated funds. In fiscal year 1993,$30,084, was provided by state appropriations. In fiscal year 1994, $161,628 was provided by state funds, $3,189 provided by industry and $9,020 provided by other sources, totaling $173,837. In fiscal year 1995, $370,618 was provided by state appropriations, $1,496 provided by self-generated funds, $1,581 provided by industry and $5,970 was provided in other non-federal funds, totaling $379,665 for fiscal year 95. In fiscal year 1996 $285,042 was provided by state appropriation, $4742 provided by industry, $14,247 provided from other non-federal funds totaling $304,031 for 1996. In fiscal year 1997, $462,012 was provided by state appropriations, $8,080 was provided by self-generated funds, $8,217 was provided by industry and $103,063 was provided from other non-federal funds totaling $581,372 for FY 97. In fiscal year 1999, $984,251 was provided through State appropriations,$40,198 provided through self-generated funds, $13,010 provided by industry and $87,942 from other non-federal sources.

Mr. Skeen. Where is this work being carried out?

Response. The work is conducted on the campus of North Dakota State University and at six different research extension centers in North Dakota. Work is also done in eastern Montana.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Fiscal year 2000 is the eleventh year of activity under this grant. The primary emphasis has been to find new crops with non-food uses and create value added products. The original objectives have been met, and continue to expand.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The cognizant staff scientist annually reviews the project and has determined that the research is conducted in accordance with the mission of this agency to expand agricultural markets.

ALTERNATIVE CROPS FOR ARID LANDS, TEXAS

Mr. Skeen. Please provide a description of the research that has been funded under the Alternative Crops for Arid Lands, Texas grant.

Response. This grant is to develop the two most abundant plants in southwestern United States, i.e. mesquite and cactus, into commercial crops through a combination of applied research and market development. In Texas, New Mexico, Arizona and California these plants occupy 72 million acres. This grant is peer reviewed internally and external reviewers include a private sector cactus breeder, the Texas Agricultural Extension Service and a specialist in wood products marketing.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this goal?

Response. The semi-arid regions of the United States that border with Mexico in Texas, New Mexico, Arizona, and California have some of the highest unemployment rates, lowest economic returns per acre, and lowest incomes in the United States. The two most abundant plant species in this region are prickly pear cactus and mesquite. By working with Mexican researchers, this grant will help to stabilize the economic situation of rural poor in Mexico and the United States. There are few crops capable of being grown sustainably in these regions. Due to the nitrogen fixing capability, and thus soil improving properties, of mesquite and high water use efficiency of cactus, these plants contribute to sustainable agriculture, and will diversify southwestern agriculture. This research group is the only center in the United States developing these plants as crops.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to dramatically improve the economic returns, and year-to-year economic stability in the southwestern United States from arid and semi-arid lands. For cactus, the goal has been to provide improved varieties that can be harvested and processed into food and forage. A collection of more than 130 varieties of cacti serves as a resource for full scale breeding program. Chromosome analysis began in fiscal year 1999 to improve breeding success. One hundred additional hybridizations are being tested. Especially significant is the start of a production trial for the top eight fruit and top two nopalito selections. The size of the production trial will be large enough to provide planting stock in quantities suitable to many growers. For mesquite, the goal is to increase its value as a result of better tree form. A genetic screening trial has been initiated to evaluate the growth and form of 20 native Texas mesquite seed sources. This research seeks to identify superior genetic material for further breeding and to maintain some of these trees as seed producers for further silvicultural research. Mesquite accomplishments include demonstrations of mesquite products at the World Trade Fair in Chicago, presentations to architects in all major cities in Texas, and providing research information that helped a new manufacturing plant license their mesquite products. Further economic

development depends on good relations and cooperation of landowners willing to sell mesquite trees from their property. In return, landowners need relevant information to formulate plans for a sustainable harvest that can incorporate considerations for grazing, wildlife, and soil improvement.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994 and the appropriation for fiscal year 1994 was $94,000. For fiscal years 1995 through 1997 the appropriation was $85,000 per year and for fiscal years 1999 and 2000 is $100,000 per year. A total of $549,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. In fiscal year 1994, $43,215 was provided by the Texas legislature.

Mr. Skeen. Where is the work being carried out?

Response. The work is being conducted by Texas A&M University, Kingsville, Texas.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. For cactus, the original objective of the project was to provide improved varieties of cactus for fruit and napolitos marketing. The fiscal year 1999 production trial represents a partial completion of the original objective by examining the yield and financial benefits of larger scale cactus cultivation. Researchers anticipate that improved varieties should be available in two to four years. Currently, a small Texas and California cactus industry exists and more economic growth can be achieved with the introduction of new varieties. For mesquite, the objective to improve the economic return largely has been met, since markets for mesquite lumber, flooring, furniture, and barbecue work products continue to improve. However, other related objectives such as growth and form, genetic screening and breeding will take longer to complete. Initial data collection for growth and form will begin in two years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Evaluation of this project is conducted annually based on the annual progress report and discussions with the principal investigator, as appropriate. The review is conducted by the cognizant staff scientist who has determined that this research is in accordance with the mission of the agency.

ALTERNATIVE SALMON PRODUCTS PROGRAM, ALASKA

Mr. Skeen. Please provide a description of the research that has been funded under the Alternative Salmon Products grant.

Response. The initial project funded under this program is the Pinbone Removal Machine Project. This project was aimed at developing a high capacity commercial pin-bone removal machine to take pinbones out of salmon fillets.

The machine promises to lower production costs for making boneless salmon fillets and provide new products like frozen skinless boneless salmon fillet portions that will open new markets for salmon fillet in shatter packs. Subsequent to initial funds provided in FY 1998, additional appropriations to the Alternative Salmon Product Program have allowed other projects to be supported. These include the Marketing Competition Project and the Salmon Quality Project.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The Alaska salmon industry has lost considerable market share worldwide to farmed salmon production. In 1994, the farmed salmon market share surpassed Alaska's market share of the world's salmon supply and has continued to climb every year since. In 1997, Norwegian farmed salmon production exceeded Alaska wild stock harvests. Also in 1997, Chilean coho salmon exports to Japan exceeded North American sockeye salmon exports to Japan. Japan has traditionally been Alaska's strongest and most lucrative export market. The current situation is an example of foreign competition undermining a traditional American industry. Though the product is harvested in Alaska, the benefits of this research are shared with fishermen residents in Washington State, Oregon, California and throughout the nation. There is still room for optimism in that worldwide salmon consumption is up and new markets for high quality affordable salmon exist.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The broad research goal of the Alternative Salmon Product Program is the development of market-desired salmon products using wild-caught salmon. In 1998 and continuing, researchers involved in the Pinbone Removal Machine Project are addressing the problem of deboning wild-caught fish in appropriate volumes, so that they can be marketed as frozen skinless boneless fillet portions rather than simply as H&G frozen fish or canned salmon. New products such as this would allow Alaskan wild caught salmon to compete more effectively with pen-reared salmon. The researchers have designed, built and tested 4 prototype pinbone removal machines, making sequential improvements in design as new problems surfaced. Their latest iteration will be tested in processing plants during the 2000 salmon season.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The initial funding of the Alternative Salmon Product Program was $400,000 in fiscal years 1998 and 1999, and in fiscal year 2000 it is $552,500. A total of $1,352,500 has been appropriated.

The fiscal year 1999 appropriations have gone to two other projects, both under the Alternative Salmon Product Program. These are the Marketing Competition Project and the Salmon Quality Project.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. Industry will contribute approximately $50,000, based on an estimated cost of $50,000 per plant, for commercial testing of the beta prototypes.

Mr. Skeen. Where is this work being carried out?

Response. The work on the Pinbone removal Machine Project has been and will continue to be conducted at both the University of Alaska Fairbanks - Fishery Industrial Technology Center in Kodiak, Alaska, and at the Geophysical Institute of the University of Alaska Fairbanks, in Fairbanks, Alaska.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The Pinbone Machine Project under the Alternative Salmon Product Program, including original and related objectives, will be completed with fiscal year 2000 funding. Other projects, like the Alternative Salmon Management Program will take about five years to complete their goals.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The proposal received in support of the fiscal year 1999 appropriation was reviewed for merit on August 18, 1999. At that time, the agency science specialist determined that the projects addressed needs and interests of the Alaskan salmon industry.

ANIMAL SCIENCE FOOD SAFETY CONSORTIUM

Mr. Skeen. Please provide a description of the research that has been funded under the animal science food safety consortium program.

Response. The Food Safety Consortium is focused on accomplishing six objectives: (1) to develop techniques for rapid detection of infectious agents and toxins in meat and poultry; (2) to develop a statistical approach for evaluating potential health risks; (3) to identify effective intervention points to control microbiological or chemical hazards; (4) to develop monitoring methodologies to detect these hazards in the distribution chain; (5) to develop technologies to complement the development of Hazard Analysis and Critical Control Point programs by USDA; and (6) to estimate costs and benefits associated with intervention alternatives.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local need for this research?

Response. The Consortium's participation in technology transfer to health departments and trade associations are helping on a regional and local level to educate consumers and food handlers on safe handling procedures. Scientific-based testing that is being developed will help provide food that will be more readily accepted in international markets and increase exports and sustainable rural economies at home. On a regional and local level, each of the institutions are involved in Hazard Analysis Critical Control Point program training for industry and are holding seminars for industry to discuss food safety research findings. In addition, the University of Arkansas is teaching food safe programs to children in state elementary schools.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. The original goal was to bring together research and expertise of institutions in three states in order to best address the areas of poultry, beef, and pork meat production from the farm to the consumer's table. In

coordination with each other, they seek to develop detection, monitoring, and prevention techniques to control or prevent the presence of infectious agents and chemical toxins in the food supply. Each year advisory and technical committees provide guidance and expertise in research planning.

In 1999, research at the University of Arkansas emphasized detection and control of pathogens from pre- through post-harvest raw and thermal processing, molecular surveillance of pathogens, predictive microbial modeling and risk assessment, a variety of rapid detection methods and education and outreach programs for children in grades K-12 and for food processors. At Iowa State University, research concentrated on swine production, irradiation, methodology and risk assessment. Work performed at Kansas State University emphasized intervention strategies, methods development, risk assessment and technology/information transfer.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $1,400,000; fiscal year 1990, $1,678,000; fiscal year 1991, $1,845,000; fiscal years 1992-11993, $1,942,000; fiscal year 1994, $1,825,000; fiscal years 1995-1996, $1,743,000 each year; fiscal year 1997, $1,690,000; fiscal years 1998-1999, $1,521,000 each year; and fiscal year 2000, $1,521,000. A total of $20,371,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The non-federal funds are provided primarily by State and private organizations. These funds provided for this grant are as follows: $1,611,947 in 1991; $1,639,050 in 1992; $1,726,153 in 1993; $2,304,223 in 1994; $2,075,145 in 1995; $2,796,097 in 1996; $2,600,545 in 1997; $1,850,899 in 1998; $3,421,866 in 1999. Thus, from 1991 through 1999 a total of $20,025,934 in non-federal funds was provided.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Iowa State University, Kansas State University, and University of Arkansas at Fayetteville, University of Arkansas for Medical Sciences at Little Rock, and Arkansas Children's Hospital.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The research projects from the Consortium continue to evolve and build on the original objectives first set out in 1989. Additional objectives are revised on an annual basis to enhance the original six objectives. Recently, the Consortium has participated in research projects that have made significant contributions to the establishment of scientific parameters used in Hazard Analysis and Critical Control Point programs. The principal investigators have developed patented tests that have significantly reduced the time necessary to detect pathogens in the processing plants.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. There has never been a formal evaluation of the Food Safety

Consortium but instead, an annual conference is organized at which a designated representative from CSREES attends. Along with other invited agency representatives such as FSIS, ARS, and ERS, CSREES participates in a steering committee meeting which critiques projects and discusses research priorities. CSREES representatives were considered part of the Technical Advisory Committee as well as members of the Food Safety Consortium Steering Committee and fully participated in meetings and conference calls. Peer reviews are conducted by expert scientists who are not members of the Consortium and determine those projects selected for funding.

APPLE FIRE BLIGHT, MICHIGAN AND NEW YORK

Mr. Skeen. Please provide a description of the research that has been funded under the Michigan and New York, Apple Fire Blight grant.

Response. This project studies fire blight in apple trees, which is a bacterial disease that can kill spurs, branches, and whole trees. The management of this disease is difficult because only one antibiotic treatment is available. The objectives of this research are to develop fire blight resistance varieties, evaluate biological and chemical control methodologies for disease management, and develop an education and extension component for disease management.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Fire blight is a destructive disease of apple trees that can kill the trees. This disease is caused by bacteria and affects apple trees in all apple growing areas of the nation. In the northeast, the disease is more prevalent because of humid weather conditions. Because there are significant needs for research in high priority national interest topics such as improved pest management systems, funds are not proposed in fiscal year 2001 to continue this Special Research Grant. At the discretion of the state, Hatch Act or other funding could be use to support this research.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals of this research are to develop transgenic apple trees through various molecular technologies, to develop new approaches to antibiotic treatments of disease, to develop an early screening technique for tree sensitivity to the disease, to evaluate biological and cultural controls and to develop and improve education and extension components of disease management. The last objective involves using disease prediction models.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Fiscal year 1977 was the first year funds were appropriated for this grant at $325,000. For fiscal year 1998-2000, $500,000 was appropriated per year. A total of $1,825,000 has been appropriated.

Mr. Skeen. What are the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds provided for 1997 were $40,127 for Michigan and $104,166 for New York State. In 1998 the state of Michigan appropriated $25,071 and the Michigan Apple Research Committee provided $15,000 for a total of $40,071 from Michigan. New York provided state

appropriated funds of $104,166 for 1998. The state appropriated funds provided for 1999 were $49,771 for Michigan and $106,689 for New York. The state appropriated funds provided for 2000 are $46,178 for Michigan and $43,200 for New York.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Michigan State University and Cornell University, New York Experiment Station.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated date of completion for the original objectives was 2000. The objectives have not been met. It is estimated by the researchers that three to five years is needed to complete this project.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last merit review of this project was in January, 1999. A site visit was made to Michigan State University in March 1999 and to Cornell University, Geneva and Ithaca, New York in April 1999. Both principal investigators were visited as well as the field sites. In summary, in surveys of established apple orchard and new planting in New York there were losses of up to 255 of trees filled by fire blight infections of rootstocks. Several new materials for control of fire blight on susceptible varieties gave promising results in field trails. Improved techniques to transfer genes into apple and to obtain flowering on the trasgenci trees have been developed so that transgenic fruits can be examined within two years. In research in Michigan a total of 50 phage isolated from fire blight were characterized with the potential of using these to control the disease. A new plant growth regulator that controls vegetative growth in apple appeared to make trees less susceptible to fire blight. A detailed study of the role of the hrpA gene in fire blight virulence has been completed with a better understanding of its involvement in virulence in the disease.

AQUACULTURE, LOUISIANA

Mr. Skeen. Please provide a description of the research that has been funded under the Aquaculture, Louisiana grant.

Response: The agency requested that the university submit a grant proposal for fiscal year 2000 that has not been received to date. Research under this program has addressed critical problems in the commercial aquaculture industry including crawfish, catfish, and other emerging species. The university has completed studies in the area of fish nutrition, fish health, fish genetics, production management strategies, alternative species, seafood processing, product quality, and broodstock development.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal investigator indicates that information generated from the funded research will have broad application for local, regional, and national aquaculture industries. Specific projects have addressed priorities

identified in the crawfish industry including water quality management, harvesting strategies, and nutrition for the production of large crawfish and development of value-added crawfish products. Problems addressed in the channel catfish industry include off-flavor, viral and bacterial diseases, gene mapping, nutrition, and an improved production system technology. Additionally, genetic studies on both hybrid-striped bass and tilapia are currently underway.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research was to provide science-based information through a basic and applied research base that specifically addressed the needs of the aquaculture industry in Louisiana and the southern region. The overall goals of the research are to improve production efficiency of important aquaculture species through enhancement of nutrient utilization, improvements in genetics, and development of new and alternative production management systems; to develop new technologies for preventing and treating prevalent diseases of important aquacultural species; and to develop new food products and new techniques and processes that improve aquacultural-food product quality. Research has led to improved channel catfish and hybrid striped bass feed formulations, production of new channel catfish vaccines, improved extraction and detection methods for off-flavor compounds, production of genetically- improved channel catfish, procedures for the production of gene maps for channel catfish, improved harvesting and production strategies for crawfish, and improved processing technologies for crawfish and other aquaculture products. Research continues to be directed at important opportunities to enhance production efficiency and commercial viability of sustainable aquaculture systems in Louisiana and the southern region.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Research to be conducted under this program continue as initiated under the Aquaculture General program in fiscal years 1988 through 1991. The work supported by this program began in fiscal year 1992 and the appropriation for fiscal years 1992-1993 was $390,000 per year, $367,000 in fiscal year 1994, and $330,000 each year in fiscal years 1995-2000, for a total of $3,127,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates that non-federal funding for this program is as follows: in fiscal year 1991, $310,051; in fiscal year 1992, $266,857; in fiscal year 1993, $249,320; in fiscal year 1994, $188,816; in fiscal year 1995, $159,810; in fiscal year 1996, $150,104; in fiscal year 1997, $158,808; and in fiscal years 1998 and 1999, $110,101. The primary source of this funding was from state sources and self-generated funds with minor contributions from industry and other non-federal sources.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Louisiana State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original specific objectives were to be completed in 1990. These specific research objectives have been met, however, research required for long-term growth of the aquaculture industry in Louisiana and the southern region continues to be addressed. The specific research outlined in the current proposal will be completed in fiscal year 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Grants are awarded to scientists within the university on a competitive peer-review basis. The entire proposal is reviewed by agency Program Managers on an annual basis. The university is required to provide an accomplishment report each year when the new grant proposal is submitted to the agency for funding. In addition, the Program Manager conducted site visits in 1996 and 1997 to meet with the scientists involved in the project and review the progress of the research. The 1999 review concluded that the proposed research is addressing important research needs of the aquaculture industry throughout the southern region, that the facilities are excellent, that the principal investigators are well-qualified, that the experimental design is sound, that the proposed research builds upon research previously funded through this program, and that the progress on previous research funded under this program is well documented. Research results from this program have had a significant impact on the aquaculture industry in Louisiana and the region.

AQUACULTURE RESEARCH, STONEVILLE, MISSISSIPPI

Mr. Skeen. Please provide a description of the research funded under the Aquaculture Research Stoneville, Mississippi grant.

Response. The agency has requested that the university submit a grant proposal that has yet to be received. Past projects funded by this grant have addressed critical problems in the farm-raised channel catfish industry including practical feeding and nutrition strategies and acoustical in-pond monitoring technologies.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal investigator indicates that results from this project will continue to have a significant impact on the competitiveness of a significant segment of the domestic aquaculture industry, namely channel catfish. The farmed-raised channel catfish industry accounts for over 70 percent of total domestic aquaculture production. Research funded by this program is directed towards improving feeds and feeding strategies and acoustical monitoring and inventory of catfish in pond production systems. These findings will have long-term impacts on the competitiveness of the farm-raised channel catfish industries in several southern states.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to address the research needs of the farm-raised channel catfish industry in the areas of water quality and nutrition. Results from this research has led to improved water quality management practices in commercial catfish ponds and improved diet formulation and feeding strategies that have been widely adopted by the industry. Research findings from this program have had a direct impact on reducing the cost of catfish feed without reducing performance and

productivity. Additionally, sonar hardware and software technologies are being developed and evaluated for use in stock assessment of channel catfish ponds.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal years 1980-81, $150,000 per year; fiscal year 1982, $240,000; fiscal year 1983-84, $270,000 per year; fiscal year 1985, $420,000; fiscal years 1986-87, $400,000 per year; fiscal year 1988, $500,000; fiscal year 1989, $588,000; fiscal year 1990, $581,000; fiscal year 1991, $600,000; fiscal years 1992-1993, $700,000 per year; fiscal year 1994, $658,000; fiscal years 1995-1997, $592,000 each year, $642,000 in fiscal year 1998, and $592,000 per year in fiscal years 1999 and 2000. A total of $10,229,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates a total of $2,101,508 in non-federal funding to support this research for fiscal years 1991-1994; $1,128,451 in fiscal year 1995; $601,473 in fiscal year 1996; $463,990 in fiscal year 1997, $464,266 in year 1998, and approximately $740,000 in fiscal year 1999. Non-federal funding is primarily provided by state funds. Additional funding is also provided from product sales, industry contributions, and other miscellaneous sources.

Mr. Skeen. Where is this work being carried out?

Response. The grants have been awarded to the Mississippi State University Agricultural and Forestry Experiment Station. All nutrition research is conducted at the Delta Branch Experiment Station, Stoneville, Mississippi. The acoustical research is conducted in cooperation with the National Center for Physical Acoustics at the University of Mississippi.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the specific original research objectives was 1984. The original objectives have been met, however, projects funded by subsequent grants continue to address the research needs of the domestic channel catfish industry as problems arise. The specific research outlined in the current proposal will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency's Program Managers and Program Specialist evaluate the progress of this project on an annual basis. The university is required to provide an accomplishment report when the new proposal is submitted to the agency for funding. Proposed new projects undergo internal review by the Mississippi State University Agricultural and Forestry Experiment Station and are reviewed externally by agency personnel consistent with United States Department of Agriculture guidelines. The Program Manager conducted a site visit in 1999. The 1998 review indicated that the research addresses key problems faced by the farm-raised channel catfish industry. Significant progress has been reported on past research and the experimental and

scientific design of the new project are sound. Scientists involved in the project are leading authorities in this area of research and linkages between the researchers and the catfish industry has lead to accelerated adoption of research findings. Adoption of improved feeds and feeding strategies developed through this program by the catfish industry has led to improved production efficiency in commercial catfish operations. The agency is planning a site visit in fiscal year 2000.

AQUACULTURE, NORTH CAROLINA

Mr. Skeen. Please provide a description of the research that has been funded under the Aquaculture, North Carolina grant.

Response. The agency has requested that the university submit a grant proposal that has yet to be received. The researchers indicate that the research will focus on improving husbandry methodologies for striped bass and rainbow trout.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal investigator indicates that the project will address specific research needs of the domestic trout and hybrid striped bass industries. Studies addressing vaccine administration and disease resistance, broodstock maintenance, and feeding strategies will result in improved culture technologies for these species in the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the project was targeted at resolving specific, industry-recognized impediments to aquaculture efficiency, profitability, and growth. The specific objectives include: improved vaccine administration methods for rainbow trout; improved broodstock maintenance methodologies for striped bass; and reduction of environmental impacts by improving system technologies and feeding strategies in hybrid striped bass production ponds.

Mr. Skeen. How long has the work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997 and the appropriation for fiscal year 1997 was $150,000. The project was not funded in fiscal years 1998 and 1999. The current fiscal year 2000 appropriation is $255,000. The total amount appropriated is $405,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university reports a total of $94,000 of non-federal funding to support research carried under this program for fiscal year 1997. The primary source of the non-federal funding was from state sources.

Mr. Skeen. Where is the work being carried out?

Response. Research is being conducted at North Carolina State University and their aquaculture research field station.

Mr. Skeen. What was the anticipated completion date for the original

objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This project was initiated in fiscal year 1997 and was funded for one year. Funding was not appropriated in fiscal years 1998 and 1999.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency will conduct the initial review of this proposal when it is submitted to the agency for funding. The proposal will be externally peer reviewed as part of the agency's evaluation.

AQUACULTURE, VIRGINIA

Mr. Skeen. Please provide a description of the research that has been funded under the Aquaculture, Virginia grant.

Response. The agency requested that the university submit a grant proposal that has yet to be received. The proposed research will document and develop fish production culture methodologies and analyze economic management and marketing strategies for a recirculating aquaculture system-based industry.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The investigators indicate that there is a need to develop a highly competitive, sustainable aquaculture industry predicated upon land-based recirculating-water system technologies in order to meet consumer demand for cultivated aquatic foods that are of high quality, safe, competitively priced, nutritious, and are produced in an environmentally responsible manner. Research refining culture system technologies have the potential of significantly enhancing domestic aquaculture production.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to identify commercially-viable aquaculture species utilizing recirculating aquaculture system technology, verifying production and culture management protocols utilizing this technology, analyze production budgets providing information upon which to build business plans, investigate marketing development strategies, and prepare scientific, technical, and popular publications to disseminate the results of this research. Research was initiated in fiscal year 1999. Initial production trials are underway, but have not yet been completed.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This was a new research initiative in fiscal year 1999. $100,000 per year was appropriated for fiscal years 1999 and 2000. The total appropriation for this grant is $200,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates a minimum of $90,000 of non-federal funding in fiscal year 1999 and $34,853 in fiscal year 2000 coming primarily from state sources.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted through the Virginia Agricultural Experiment Station, Virginia Polytechnic Institute and State University, Blacksburg, Virginia and in collaboration with private aquaculture firms in Virginia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This proposal seeks funding for year two of a proposed three year project. The anticipated completion date for the fiscal year 2000 component of the project is July 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency evaluates the progress of this project on an annual basis. The university is required to submit an accomplishment report each year when the new proposal is submitted to the agency for funding. The objectives described in the proposal are relevant to state, regional, and national goals and address an important opportunity within the regional aquaculture industry. The specific objectives, methodology, and experimental design are clearly presented and experimentally sound. Personnel and facilities are appropriate for the stated objectives and objectives should be attained within budgetary and time constraints. Appropriate literature review and justifications for research were provided.

AQUACULTURE PRODUCT AND MARKETING DEVELOPMENT, W.V.

Mr. Skeen. Please provide a description of the research that has been funded under the Aquaculture Product and Marketing Development, West Virginia.

Response. The agency requested that the university submit a grant proposal that has yet to be received. The research program is aimed at developing a viable and competitive aquaculture industry in West Virginia and the Appalachian region. The specific objectives of the project address state and regional needs by improving the short-term viability and long-term sustainability of aquaculture production and processing firms in West Virginia and similar areas of Appalachia. Specific research strategies include the development of marketing strategies for trout producers and processors, increasing the economic efficiency and profitability of trout-based enterprises, improving the consistency and quality of fresh trout fillets and value-added smoked trout products, and to implement a technology transfer component to disseminate information generated by this project to the aquaculture industry in Appalachia.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The researchers indicate that there is a regional and national need to evaluate marketing and product development for small scale aquaculture systems in rural communities. In addition, there is a need to improve the efficiency and sustainability of these systems.

Mr. Skeen. What was the original goal of this research and what has been

accomplished to date?

Response. The research proposes to develop sound marketing strategies for aquaculture products, improve the economic efficiency of aquaculture production systems, and improve the quality and variety of aquaculture products in West Virginia and the Appalachian region.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. A grant has been awarded from funds appropriated as follows: fiscal year 1998, $600,000 and $750,000 for each of fiscal years 1999 and 2000. A total of $2,100,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university indicated that there were no non-federal funds provided in fiscal years 1998 and 1999 for this project.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted at the University of West Virginia in Morgantown and at off campus sites with a variety of potential cooperators.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated in fiscal year 1998. Research addressing the original objectives is currently underway and the anticipated completion date for these objectives is fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency conducted an external and internal peer review of the original proposal. The proposal was peer reviewed by 10 external reviewers and the agency's National Program Leaders for Aquaculture, and the Aquaculture Program Specialist. Although the proposal was aimed at important issues facing the aquaculture industry in the region, a number of significant concerns were expressed by both external and agency reviewers. These concerns with recommendations were presented to the university and a revised fiscal year 1998 proposal was submitted and approved. The Agricultural Experiment Station requested that a planning review be held to provide recommendations to the University to assist in developing and refining the direction and focus of the aquaculture program at West Virginia University. An external planning review was held in August, 1999, facilitated by the National Program Leaders and Program Specialist. The agency and West Virginia University agreed that additional time would be needed to develop a complete, detailed proposal for the fiscal year 1999 funding. West Virginia University requested, in their fiscal year 1999 proposal submission, that the funds be obligated but restricted until a detailed proposal was submitted and approved by the agency. The agency is currently awaiting receipt of the revised fiscal year 1999 proposal.

BABCOCK INSTITUTE FOR INTERNATIONAL DAIRY RESEARCH AND DEVELOPMENT

Mr. Skeen. Please provide a description of the research that has been

funded under the Babcock Institute grant.

Response. The Babcock Institute for International Dairy Research and Development was established with participation of the University of Wisconsin-Madison College of Agriculture and Life Sciences, School of Veterinary Medicine and the Cooperative Extension Division. The objective of the Babcock Institute is to link the U.S. dairy industry with the dairy industry in the rest of the world through degree training, continuing education, technology transfer, adaptive research, scientific collaboration and market analysis.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the need is to strengthen dairy industries around the world, to enhance international commercial and scientific collaborative opportunities for the U.S. dairy industry, and to draw upon global perspectives to build insight into the strategic planning of the U.S. dairy industry.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the Institute remains the linkage of the U.S. dairy industry with the rest of the world through training, continuing education and outreach, technology transfer, adaptive research, scientific collaboration and market analysis. Initial efforts were focused on planning and staffing. An initial activity was, and continues to be, the development of multi language extension materials about basic management techniques essential to optimize performance of U.S. dairy cattle overseas. This activity has grown to include manuals on Breeding and Genetics, Lactation and Milking, and Basic Dairy Farm Financial Management published in English, Spanish, French, Russian, and Chinese. Research on potential implications of NAFTA and GATT on the U.S. dairy industry was completed. A technical workshop on dairy grazing in New Zealand and the Midwest was organized and held in Madison during the fall of 1993. A technical workshop on Nutrient Management, Manure and the Dairy Industry: European Perspectives and Wisconsin's Challenges was held in Madison, Wisconsin during September 1994. A round table was held in January 1995 addressing "World Dairy Markets in the Post-GATT Era." Sponsored the Great Lakes Dairy Sheep Symposium in 1995 and 1996. Created a World Wide Web site in 1996 for distribution of Babcock Institute technical dairy fact sheets in four languages. The first International Dairy Short Course for a group of producers and technicians from Argentina has been organized on the University of Wisconsin Campus. Scientists' are being supported in collaborative research with New Zealand primarily to gain a better understanding of grazing systems as related to dairy management. An analysis of the impact of changes in European dairy policies has been completed. The Institute sponsored a Minnesota-Wisconsin Dairy Policy Conference to provide insights into current agricultural programs and policy issues in the dairy sector of the U.S. economy.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal years' 1992 and 1993, $75,000 per year; fiscal year 1994, $250,000; and fiscal years' 1995-1998, $312,000 per year; fiscal year 1999, $400,000; and fiscal year 2000, $510,000. A total of $2,648,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. During fiscal year 1992, $13,145 of State funds were used to support this program and $19,745 of State funds in fiscal year 1993 for a total of $32,890 during the first two years of this research. Information is not available for fiscal years 1994-1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of Wisconsin-Madison College of Agriculture and Life Sciences.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Babcock Institute's overarching mission has been to link the US dairy industry and its trade potential with overseas dairy industries and markets. The original objectives of this project have remained consistent over the years. However, each year specific objectives were proposed to further the mission of the Institute and to build on previous accomplishments. The Institute has accomplished specific objectives each year in a timely manner. The Babcock Institute has remained true to its original objective of linking Wisconsin and the US to dairy industries around the world. This objective remains increasingly important with continued development of international markets for dairy products and technologies. The University researchers anticipate that work currently in progress will be completed by September 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Babcock Institute undergoes two independent review processes each year. The first is done by a committee of university and industry representatives who review the annual research proposal and amend it prior to submission to the agency. The annual proposal is reviewed by agency technical staff prior to approval for fund release. In addition, the institute was included in a comprehensive review of the programs of the Department of Dairy Science at the University of Wisconsin in May 1995. The agency project officer has conducted two on site reviews of the institute since its formation in 1992. The most recent review has found that the approach proposed by the researchers is appropriate and that the researchers are well qualified to perform the objectives as stated. The objectives of the proposal are within the mission of the United States Department of Agriculture and the Cooperative State Research, Education, and Extension Service.

BIODIESEL RESEARCH, MISSOURI

Mr. Skeen. Please provide a description of the research that has been funded under the biodiesel research grant.

Response. Research on biodiesel involves examining the feasibility of producing biodiesel and other higher value products from oilseed crops including soybeans, canola, sunflower and industrial rapeseed. The project is also evaluating local processing plants whereby farmers could produce crops, process the crops locally and use the fuel and high protein feed coproducts on their farms or locally. This project undergoes merit review at the College of Agriculture.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The initial work is being conducted in Missouri. The results may provide the agricultural community with alternative crops and more diverse markets, additional marketable products and a locally grown source of fuel. This will result in increased investment in local communities, additional jobs, and increased value added in the farm and rural community sectors.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The ultimate goal of this project was to conduct research and development in an effort to help commercialize biodiesel as an important alternative fuel that could be used in fleets throughout the country. This would help to attain the objectives of the comprehensive Energy Policy Act of 1992, also known as EPACT. Success would increase the use of agricultural products as well as diversifying product markets, both of which would be beneficial to American farmers. This is especially important during periods of large commodity surpluses and extremely depressed prices such as we are currently experiencing. An important part of the on-going research has been to identify potential markets where biodiesel can compete on an economic basis with other alternative fuels. An important part of the research this past year is to compare the cost of using a biodiesel blend, 20 percent biodiesel/80 percent petroleum diesel, as an alternative fuel in the St. Louis Metropolitan Fleet with other alternative fuels. Results indicate that the incremental cost of biodiesel over conventional diesel fuel is $1,013 per EPACT credit. The incremental cost of the other options investigated was $4,000 for compressed natural gas and $3,281 for E-85 per credit. Thus, from an incremental cost perspective, biodiesel is the least cost option for helping the City of St. Louis meet the clean air requirements of Energy Policy Act.

Mr. Skeen. How long has this work been underway, and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. The work for this program began in fiscal 1993, and the appropriation for that year was $50,000. The appropriation for fiscal year 1994 was $141,000; and for fiscal years 1995-2000, $152,000 annually. A total of $1,103,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The source of non-federal funds is state appropriated funds. The level in 1994 was $7,310. The funding level for 1995 was $74,854. Cost sharing by the University of Missouri each year for fiscal year 96 and fiscal year 97 was $80,000 and $86,000 respectively. Total cost sharing for the project by the University of Missouri has been $242,224. Matching funding for fiscal years 1998 and 1999 was $77,431 and $79,730. Total matching for the entire period has been $399,385. Additionally, some work funded by this grant has been conducted in cooperation with the National Biodiesel Board, plus the Missouri Soybean Merchandising Council.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out at the University of Missouri-Columbia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigator believes that the work will be completed at the end of fiscal year 2000. Research and development completed by the end of that period will provide private industry with the information needed to successfully commercialize biodiesel.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The evaluation of using biodiesel as a complete fuel and in a blend has been met. This project is evaluated on an annual basis based on the annual progress report, discussions with the principal investigator as appropriate, and agency participation in collaborative activities related to this project. The review is conducted by the cognizant staff scientist and it has been determined that the research is performed in accordance with the mission of this agency.

BLOCKING ANHYDROUS METHAMPHETAMINE PRODUCTION (IOWA)

Mr. Skeen. Please provide a description of the research that has been done under the Blocking Anhydrous Methamphetamine Production Grant, Iowa.

Response. The Agency has requested Iowa State University to submit a grant proposal that has not yet been received. This is a new special grant for which there have been no previous awards.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher has indicated that anhydrous ammonia, a commonly used agricultural fertilizer, can be used as an ingredient for making methamphetamine, an illegal and highly addictive drug which has posed a drug enforcement problem for Iowa and other Midwestern states in recent years. At the discretion of the State, Hatch Act or other formula funding could be used to support this research. The National Research Initiative is another possible funding source for this project.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research is to discover a chemical procedure that will render anhydrous ammonia ineffective in producing methamphetamine while keeping the anhydrous ammonia cost-efficient and effective as a fertilizer. Preliminary results suggest that certain metal salts in catalytic amounts can be effective at inactivating the drug-producing reaction.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000 ?

Response. Preliminary work funded by the State has been underway for approximately five months. This is a new special grant and $212,500 has been appropriated for fiscal year 2000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. State funds in an amount less than $5,000 were used to get the project started in fiscal year 1999. The State plans to cost-share the salaries of the principal investigator and a faculty collaborator in the amounts of $20,000 and $25,000 per year, respectively.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted in the Chemistry Department at Iowa State University, Ames, Iowa.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigator anticipates completing the original objectives of the project in two or three years. Additional or related objectives have not been specifically identified at this time.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. As a new special grant for which a proposal has not yet been received, this project has not yet been evaluated. A merit review panel will be convened to evaluate the project upon receipt of a proposal for fiscal year 2000.

BOVINE TUBERCULOSIS, MICHIGAN

Mr. Skeen. Please provide a description of the research that has been conducted under the Bovine Tuberculosis, Michigan grant.

Response. The agency has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for the research?

Response. The need for this research relates to the critical problem of bovine tuberculosis which has now been discovered to have spread into the white-tailed deer population in the state of Michigan. If information on the scope of this disease in deer and methodologies to monitor and reduce this problem is not available rather soon, this could cause significant problems for the plans to eradicate tuberculosis from cattle in the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research is to develop information about the spread of the bovine tuberculosis organism, *Mycobacterium bovis*, within the deer population of Michigan. Appropriate control programs can not be devised until the epidemiologic information is available.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $170,000.

Mr. Skeen. What is the source and amount of non-federal funds by fiscal year?

Response. Because this project is just being initiated in this fiscal year, 2000, there is no information available about other funding for the project.

Mr. Skeen. Where is this work being performed?

Response. The research is being performed in the College of Veterinary Medicine, Michigan State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Because this project is just being started in fiscal year 2000, no evaluation has been done at this time.

BRUCELLOSIS VACCINE, MONTANA

Mr. Skeen. Please provide a description of the research that has been conducted under the Brucellosis Vaccine, Montana grant.

Response. This project will study the immune response of bison to *Brucella abortus* antigen which has been incorporated into an organism that can be given orally to the animals. The objective is to produce an oral vaccine that can be easily administered to the bison without subjecting them to intensive handling procedures.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for the research?

Response. The research project is intended to develop a strategy for vaccinating or immunizing cattle against brucellosis by incorporation of *Brucella abortus* genes into an orally administered system.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the project was to accomplish incorporation of Brucella genes which code for specific antigens into Salmonella species of bacteria and test the efficacy of oral administration of this material in developing systemic immunity in bison.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work was started in fiscal year 1999. The appropriation for fiscal year 1999 was $150,000, and for fiscal year 2000 was $425,000 for a total of $575,000.

Mr. Skeen. What is the source and amount of non-federal funds by fiscal

year?

Response. The source and amount of non-federal funds for fiscal year 1999 was $67,401 from state sources.

Mr. Skeen. Where is this work being performed?

Response. The work is being performed at Montana State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives was May, 2002 or three years from the initiation of the project.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. As the project was started in the summer of 1999, there has not yet been an agency evaluation.

CENTER FOR ANIMAL HEALTH AND PRODUCTIVITY, PENNSYLVANIA

Mr. Skeen. Please provide a description of the research that has been funded under the Center for Animal Health and Productivity grant.

Response. This research is designed to reduce nutrient transfer to the environment surrounding dairy farms in the Chesapeake Bay watershed. Progress to date includes the development of an individual dairy cow model which will predict absorbed amino acids and the loss of nitrogen in manure. This model has been developed into a user friendly software so that trained farm advisors can evaluate herd nutrient management status while on a farm site. A whole farm model has been developed which integrates feeding and agronomic practices to predict utilization of nitrogen and farm surpluses. Using these tools, a survey of dairy farms in the region has been done to assess nitrogen status on dairy farms and potential management practices to reduce nitrogen excesses on dairy farms. Refinement of the model tools and research to refine estimates of the environmental fate of excess nitrogen from dairy farms is in progress. During the last year, researchers have discovered that significant nitrogen is lost from the animal housing facility in the form of ammonia volatilization to the atmosphere. Preliminary estimates indicate that as much as 50% of the nitrogen consumed by dairy cows is lost as ammonia to the atmosphere and never reaches the manure storage and management system. Two on-site reviews of the program have been conducted by the CSREES Project Officer and a third is planned during 2000. The animal and farm models have been published in a peer reviewed scientific journals.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that reducing non-point pollution of ground and surface water by nitrogen from intensive livestock production units are of concern nationally, and especially in sensitive ecosystems like the Chesapeake Bay. This research is designed to find alternative feeding, cropping and management systems which will reduce net nutrient flux on Pennsylvania dairy farms to near zero. The principal researcher believes this research to be of national, regional, and local need.

Members of the research team have applied for funding through both the National Research Initiative and the Fund for Rural America. The Initiative for Future Agriculture and Food Systems should provide additional opportunity for funding of this research.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goals of this research remains the development of whole farm management systems which will reduce nutrient losses to the external environment to near zero. To date the researchers have developed their own models to more accurately formulate rations for individual dairy cows which permit the comparison of alternative feeding programs based upon both maximal animal performance and minimal nutrient losses in animal waste. This model is being tested on select commercial dairy farms to evaluate the extent to which total nitrogen losses in manure can be reduced without impacting economic performance of the farm. At the same time, whole farm nutrient models have been developed to evaluate alternative cropping systems which will make maximum use of nutrients from animal waste and minimize nutrient flux from the total farm system. These tools are currently being used to survey the current status of nutrient balance on farms in the area and efforts to fine tune the tools are in progress. The recent discovery of the quantitative significance of nitrogen loss as ammonia to the atmosphere and potential transport from the farm and redeposition to the earth's surface raises a whole new aspect of nutrient management.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. A grant has been awarded from funds appropriated in fiscal year 1993 for $134,000 and in fiscal year 1994 for $126,000. In fiscal years 1995-2000, $113,000 has been appropriated each year. A total of $938,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This information is not available at the present time.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of Pennsylvania, College of Veterinary Medicine at New Bolton Center, PA.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The University researchers anticipate that work currently underway will be completed by September 2000. This will complete the original objectives of the research. The principal researcher indicates that consideration has been given to the broadening of objectives to include additional nutrients in the model system, but this has been dropped because technical expertise required is currently not readily available.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Center for Animal Health and Productivity Project was last

reviewed in June 1997. An on site review by agency technical staff was conducted in June 1995. It was concluded that project objectives are within the goals of the program, are within the mission of both the USDA and CSREES, and the institution is well equipped and qualified to carry out the research project. The institution has made excellent progress toward the completion of the original goals of the project, but still must evaluate the effectiveness of the use of the new tools developed in reducing nutrient runoff from commercial dairy farms in the watershed of the Chesapeake Bay.

CENTER FOR RURAL STUDIES, VERMONT

Mr. Skeen. Please provide a description of the program that has been funded under the Center for Rural Studies Project in Vermont.

Response. The Center for Rural Studies Project involves applied research focused on developing and refining social and economic indicators used to evaluate the impact of economic development programming and activities. They are perfecting a delivery format for technical assistance for community and small business development. A major component of current research relates to utilization of the world wide web as a delivery vehicle. Project proposal undergoes a merit review within the agency.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This is an on-going pilot to demonstrate the effective development and implementation of applied research, training, education, and technical assistance related to rural development. The grant has addressed methodology and strategies for assessing rural development program impacts.

Mr. Skeen. What was the original goal of this research and what has been accomplished?

Response. The original goal was to create a database and analytical capability for rural development programming in Vermont. Examples of past accomplishments include maps presented to target child hunger programs, targeted areas for other types of rural development program intervention, analytical reports to guide the development of retail shopping areas, an "Economic Handbook for Vermont Counties", and strategies for using the world wide web to disseminate information.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The grant was initiated in FY 1992. Appropriated amounts are: FY's 1992-93, $37,000 per year; FY 1994, $35,000; FY's 1995-98, $32,000 per year; FY 1999-2000, $200,000 for total appropriations of $637,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Fiscal year 1991 included $91,130 in state matching funds. Fiscal years 1993, $143,124; 1994-96, $3,547 state matching funds. Fiscal years 1997-98 state dollars were $2,931 plus researcher's salary. No non-Federal dollars were provided for fiscal year 1999-2000.

Mr. Skeen. Where is this work being carried out?

Response. Applied research and outreach is being carried out through the

University of Vermont.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original completion date was September 30, 1993. The original objectives of this research have been met. The additional objectives being presented for the current year will be completed by September 30, 2002. Proposal for current year has not been received to date.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency evaluates the merit of research proposals as they are submitted. No formal evaluation of this project has been conducted. The principal investigators and project managers submit annual reports to the agency to document impact of the project. Agency evaluation of the project includes peer review of accomplishments and proposal objectives and targeted outcomes.

CHESAPEAKE BAY AGROECOLOGY, MD

Mr. Skeen. Please provide a description of the research that has been funded under the Chesapeake Bay Agroecology, MD special grant.

Response. The Chesapeake Bay Agroecology grant focuses on increasing our understanding of nutrient cycling, retention and utilization by vital agricultural industries located within vulnerable Chesapeake Bay watershed ecosystems that have been impacted by outbreaks of the toxic microorganisms *Pfiesteria*. There is a specific focus on Maryland's Eastern Shore.

This research focus has been identified as a priority by the State of Maryland's Blue Ribbon Pfiesteria Action Commission Report (1997), and by a Research, Education, and Economics (REE) strategic plan emphasis, Greater Harmony Between Agriculture and the Environment, that calls for a better understanding of the linkages between agricultural production, water and soil quality, range and forest land health, and habitat protection.

Since the projects were initiated last year, investigators spent the first year designing and implementing their research. While some preliminary results are available, quantitative conclusions will require more time.

Requested funds in fiscal year 2000 will support interdisciplinary projects that bring together the expertise of numerous scientists located at institutions throughout the University System of Maryland. These scientists continue to generate technical and scientific advances that guide federal, state and local policy responses to *Pfiesteria* outbreaks.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research.

Response. The continued viability of Maryland's important coastal agricultural economy, and the protection of Chesapeake Bay and Atlantic Coastal aquatic and agricultural resources from future *Pfiesteria* outbreaks, depends upon our ability to prevent future toxic algal blooms by stemming the flow of nitrogen, phosphorus, and other agricultural nutrients into estuarine waterways.

Maryland is an acknowledged leader in implementing agricultural nutrient management, soil conservation, conservation reserve, Chesapeake Bay tributary team and other cooperative planning strategies. However, non-point sources of nutrients remain a major source of pollution into Atlantic Coastal waterways, and farmland remains the largest controllable source of non-point nutrient loading into Chesapeake Bay. Thus, it is essential that we continue to increase our efforts to stem nutrient losses into waterways while preserving and enhancing important agricultural industries.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research is to increase our understanding of nutrient (nitrogen and phosphorus) cycling, retention and utilization by vital agricultural industries located in coastal regions of Chesapeake Bay, and to develop new technologies and strategies that limit nutrient losses while enhancing vital agricultural industries. This project was initiated in fiscal year 1999.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This project was initiated in fiscal year 1999, and has received $150,000 in fiscal years 1999 and 2000. A total of $300,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The project is in its first year. The state of Maryland has pledged to match 100 percent of the federal funds provided in fiscal year 2000 and in future years for the Chesapeake Bay Agroecology Project.

Mr. Skeen. Where is the work being carried out?

Response. This research will be conducted at University System of Maryland institutions and field research stations located throughout the state, with an emphasis on the Eastern Shore of Maryland which experienced significant *Pfiesteria* outbreaks.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Major progress has been made towards meeting specific projects as well as regional objectives. However, the issues being addressed are complex and solutions will require a long-term approach.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project has not yet been reviewed by the agency. However, the projects supported by this special grant are peer reviewed by an independent, external scientific panel and before competitive awards are made to qualified scientists located throughout the University System of Maryland.

CHESAPEAKE BAY AQUACULTURE, MARYLAND

Mr. Skeen. Please provide a description of the research funded under the

Chesapeake Bay Aquaculture grant.

Response. The agency requested that the university submit a grant proposal that has yet to be received. The objective of the Chesapeake Bay Aquaculture project is to improve the culture of striped bass and its hybrids through genetic improvement, reproductive biology, nutrition, health management, waste management, and product quality. The research is aimed at enhancing production efficiency, product safety, and provides a good balance between basic and applied research.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal investigator indicates that the Mid-Atlantic region of the country continues to play a significant role in the overall expansion of the domestic aquaculture industry. Research supported through this program will assist in enhancing the culture of striped bass and its hybrids in the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original research goal was to generate new knowledge that can be utilized to address serious problems limiting the expansion of the aquaculture industry in Maryland and the Mid-Atlantic region. The program concentrates on closing the life cycle, enhancing production efficiency, decreasing effluents, and improving product quality under aquaculture conditions of striped bass and its hybrids. Research is conducted in the areas of growth, reproduction and development, nutrition, aquacultural systems, product quality, and aquatic animal health. Progress has been made in developing controlled artificial spawning techniques, cryopreservation of sperm, and refining the nutritional requirements.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported under this grant began in fiscal year 1990 and the appropriation for fiscal year 1990 was $370,000. The fiscal years 1991-1993 was $437,000 per year; fiscal year 1994, $411,000; fiscal years 1995-1998, $370,000 each year, and for each of fiscal years 1999 and 2000, $385,000. A total of $4,342,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university reports the amount of non-federal funding for this program is as follows: in fiscal years 1991 and 1992, $200,000; in fiscal years 1993 and 1994, $175,000; in fiscal year 1995 $400,000; in fiscal year 1996 $536,000; in fiscal year 1997 approximately $400,000; in fiscal year 1998, $360,000; and in fiscal year 1999, approximately $360,000. These funds are from direct state appropriations and other non-federal funding sources.

Mr. Skeen. Where is the work being carried out?

Response. Research is being conducted at the University of Maryland.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the

anticipated completion date of additional or related objectives?

Response. The original specific research objectives were to be completed in 1993. The original specific research objectives have been met, however, research funded through this grant continues to address problems faced by the hybrid-striped bass industry in Maryland and throughout the country. The specific research outlined in the current proposal will be completed in fiscal year 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency's Program Managers and Program Specialist evaluate the progress of this project on an annual basis. The researchers are asked to the develop a research proposal consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development. The university awards grants consistent with United States Department of Agriculture guidelines based upon internal competitive peer review. The 1999 review concluded that the proposal was well written with objectives clearly stated; that excellent progress is reported on previous work; that scientific and technical expertise is excellent; and that the proposal addresses high-priority research needs. The proposal does address high priority research needs for the aquaculture industry at the state, regional, and national level

and is consistent with the National Science and Technology Council's Joint Subcommittee on Aquaculture Strategic Plan for Aquaculture Research and Development.

CITRUS TRISTEZA

Mr. Skeen. Please provide a description of the research that has been funded under the citrus tristeza research program grant.

Response. Nine projects were selected for funding through a CSREES competitive grants program. Some of the research included survey information on distribution of the brown citrus aphid and Citrus Tristeza Virus in Louisiana and Arizona, the develop of resistant citrus varieties to the virus, better understanding of virus strains and the disease complex and biological control efforts on the brown citrus aphid in Florida.

Mr. Skeen. According to this research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. Citrus Tristeza virus is a problem in all citrus growing areas of the United States and Puerto Rico. The recent introduction of a new vector, the brown citrus aphid, into Florida has allowed for another pathotype of the virus to be introduced. This is a more destructive pathotype of the virus that causes more damage than those pathotypes already established in the citrus producing areas.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research is to reduce losses in citrus through research the characterization and detection of citrus tristeza virus strains, biology and control of the brown citrus aphid; host plant resistance; epidemiology and crop loss assessment; development of cross-protecting citrus tristeza virus strains, and research to enhance virus free budwood programs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999 at the appropriation level of $500,000 and for fiscal year 2000, the appropriation is $595,000. A total of $1,095,000 has been appropriated.

Mr. Skeen. What is the source and amount of nonfederal funds provided by fiscal year?

Response. There are no non-federal funds provided for this grant.

Mr. Skeen. Where is this work being carried out?

Response. Research is being carried out at land grant universities and research centers in the Florida, Louisiana, California, and Arizona.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This is the second year of this funding. An anticipated completion has not been determined as the original objectives have not been met at this time.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. All projects underwent a peer review at the University level, a scientific peer review and an agency merit review in August, 1999.

COASTAL CULTIVARS, GA

Mr. Skeen. Please provide a description of the research that has been funded under the Coastal Cultivars grant.

Response. The Cooperative State Research, Education, and Extension Service has requested the university to submit a grant proposal that has not yet been received. The research will address new plant crops and sustainable production systems.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The research need to which this grant is directed is to potential new crop plants for the South Eastern United States Coastal zone and develop sustainable production systems. The results will have application throughout the region. Farmers currently have few options.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to improve rural income by identifying new crop cultivars for production in this area that now has few options.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997 and the appropriations for fiscal year 1997 was $200,000, for fiscal year 1998, $250,000 for fiscal year 1999 was - 0 -. The appropriations for fiscal year 2000 is $170,000. The total is $411,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were estimated to be $97,400 in 1997 and $146,200 in 1998.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out at the University of Georgia Coastal Garden research facility.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is fiscal year 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Project proposals for this program were reviewed and evaluated in fiscal years 1997 and 1998.

COMPETITIVENESS OF AGRICULTURE PRODUCTS, WASHINGTON

Mr. Skeen. Please provide a description of the research that has been done under the Competitiveness of Agriculture Products research grant?

Response. This research identifies international marketing opportunities for Northwest firms in the forest products and food products sectors.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local need for this research?

Response. Most food processing firms are small. Their export sales are made in many widely scattered markets with different languages, customs, institutions, and market structures. These markets have also been subjected to wrenching changes. University researchers provide a central and stable core of knowledgeable experts who can guide small export businesses in navigating these markets successfully.

Forest products from the Pacific Northwest can be shipped to Asian markets for less than shipping them to the eastern population centers in the United States. Research has opened Asian markets to U.S. light frame construction building technology, providing good opportunities to export higher valued secondary manufactured products to Japan and China. Research has also been focused on forest management alternatives that can better satisfy environmental goals with less negative impacts on timber-dependent communities. The Northwest agricultural economy is highly dependent upon being able to export given that food production in the region greatly exceeds food consumption.

Northwest wood products companies that could export are generally small

and are not able to provide their own research. Construction technologies used in Asian markets are inferior to U.S. technology, yet there is a long history of use and cultural appreciation of traditional methods. Deregulation and change in these markets has required extensive research on comparability of alternative product and building standards, quality and service needs, training in the U.S.technology, and customization to foreign consumer values. The Pacific Northwest can grow more wood with higher quality using more advanced technologies while reducing the impact on timber-dependent communities from harvest constraints to protect certain species.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to provide the information on markets and product technologies that can open higher-valued international markets to U.S. exporters. Foreign purchasers need information on the advantages of U.S. products, and U.S. exporters need information on the substantially different quality and service requirements for serving foreign markets. If the United States can remain competitive and retain its presence in these markets in the face of a stronger dollar, exports should return to a high growth path once Asian economies recover. Evidence to date suggests that this is indeed happening.

The food production research has focused on finding new market opportunities for Pacific Northwest producers, solving technical impediments to exports and developing new products and new processes that will enhance exports. It has pinpointed emerging market opportunities in Southeast Asia, China, Mexico, and Latin America. It has improved the export quality of diverse products, such as asparagus, apples, grass-seed, and wheat. It has helped commercialize high-value products, such as Wagyu beef, azuki beans, wasabi radish and burdock, and pioneered new food processing technologies that produce fresh-like, shelf-stable products and that save energy and reduce waste.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work began in fiscal year 1992. The appropriation for fiscal years 1992-1993 was $800,000 each year; fiscal year 1994, $752,000; fiscal years 1995-1998, $677,000 each year; and $680,000 in fiscal years 1999 and 2000. A total of $4,420,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $716,986 State appropriations, $209,622 product sales, $114,000 industry, and $661,119 miscellaneous, for a total of $1,701,727 in 1991; $727,345 State appropriations, $114,81 product sales, $299,000 industry, and $347,425 miscellaneous for a total of $1,488,351 in 1992; $1,259,437 State appropriations, $55,089 product sales, $131,000 industry, and $3,000 miscellaneous, for a total of $1,448,526 in 1993; $801,000 State appropriations, $1,055,000 product sales, $1,040,000 industry, and $244,000 miscellaneous, for a total of $3,140,000 in 1994; $810,000 State appropriations, $42,970 product sales, $785,000 industry, and $2,000,000 gift of a ranch due to the International Marketing Program for Agricultural commodities and Trade Center's research on Wagyu cattle, for a total of $3,637,970 in 1995; $844,000 State appropriations, $45,000 product sales $900,000 industry, and $45,000 miscellaneous, for a total of $1,834,000 in

1996; $876,000 State appropriations, $1,606,000 industry, for a total of $2,482,000 in 1997, $1,180,000 State appropriations, $604,000 industry, for a total of $1,784,000 in 1998, and $1,551,000 State appropriations, $1,006,400 industry, $62,000 product sales, and $30,096 miscellaneous, for a total of $2,649,496 in 1999.

Mr. Skeen. Where is the work being carried out?

Response. The food research is being carried out by the International Marketing Program for Agricultural Commodities and Trade (IMPACT) at Washington State University, Pullman, and the forest products research is carried out at the Center for International Trade in Forest Products (CINTRAFOR) at the University of Washington, Seattle.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was projected for 3 years duration to be completed following fiscal year 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Two evaluations of the Washington State University component of the project were conducted in 1992 by the U.S. Department of Agriculture. The State of Washington Legislative Budget Committee gave the Washington State Center exemplary marks for meeting its objectives. On-site reviews are conducted annually of the University of Washington component of the project through annual meetings of the project's executive board attended by the agency's staff. Both components are reviewed annually by the agency. The project is meeting the key objective of trade expansion through innovative research. The University of Washington project was formally reviewed by the agency in 1991. State reviews were completed in 1992 and 1994. A formal review by the University was completed in 1997. A broad survey of constituents impacted by the research was completed, resulting in a very favorable review of the Center's activities and a recommendation to continue this research. In 1998, State of Washington legislation eliminated the requirement for state reviews of the center, including one scheduled for 1999, based on hearings that focused on the other favorable reviews and the continuous oversight by the Executive Board.

COOL SEASON LEGUME RESEARCH

Mr. Skeen. Please provide a description of the research that has been funded under the Cool Season Legume Research grant.

Response. The Cool Season Legume Research Program involves projects to improve efficiency and sustainability of pea, lentil, chickpea, and fava bean cropping systems collaborative research. Scientists from seven states where these crops are grown have developed cooperative research projects directed toward crop improvement, crop protection, crop management, and human nutrition/product development.

Mr. Skeen. According to the research proposal, or principal researcher, what is the national, regional or local need for this research?

Response. The multi-state region covered by this program represents most

of the nation's production of cool season food legumes. These minor crops are very important economically to the region, are the primary source of these important food items, and contribute significantly to U.S. agricultural exports. The growers face a number of production problems that need research if this industry is to compete with international competition. In addition, use of these crops in rotation with wheat is critical to the production of wheat, the major cash crop for the region. National research in the area of crop genetics could potentially be supported by competitive grants awarded under the National Research Initiative and the Initiative for Future Food and Agricultural Systems.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The principal researcher believes the original goal of this project was to improve efficiency and sustainability of cool season food legumes through an integrated collaborative research program and genetic resistance to important virus diseases in peas and lentils. Evaluation studies of biocontrol agents for root disease organisms on peas are underway. Other studies are evaluating integration of genetic resistance and chemical control. Considerable progress has been made using biotechnology to facilitate gene identification and transfer. Management system studies have addressed tillage and weed control issues.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 with appropriations for fiscal year 1991 of $375,000; fiscal year 1992 and 1993 $387,000 per year; fiscal year 1994, $364,000; fiscal year 1995, $103,000; fiscal years 1996 and 1999, $329,000, fiscal year 2000 $329,000. A total of $3,261,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds provided for this grant were as follows: 1991, $304,761 state appropriations, $14,000 industry, and $18,071 other non-federal; 1992, $364,851 state appropriations, $15,000 industry, and $14,000 other non-federal; 1993, $400,191 state appropriations, $19,725 industry, and $10,063, other non-federal; and 1994, $147,607 non-federal support. Non-federal support for 1995 was $150,607; for 1996 it was $386,887; for 1998, $392,000 and for 1999 $557,000.

Mr. Skeen. Where is this work being carried out?

Response. Research has been conducted at agricultural experiment stations in Idaho, Oregon, Washington, Wisconsin, Minnesota, New York and New Hampshire. The funds have been awarded competitively among participating states and not all states receive funds each year.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The projected duration of the initial project was five years. Revised objectives are expected to be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide

a summary of the last evaluation?

Response. The project is evaluated annually by a university/industry advisory panel. Proposals are peer reviewed at the universities and by the agency National Program Leaders. This research has provided vital information which is already being used to improve production management. However, a number of critical issues related to insect and disease control as well as crop quality remain to be addressed. Breeding for insect and disease resistance is given the highest priority, while crop management alternatives to help reduce disease and insect pest problems will continue to be studied.

CRANBERRY AND BLUEBERRY, MASSACHUSETTS

Mr. Skeen. Please provide a description of the research that has been funded under the cranberry/blueberry research program grant.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to this research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. The research is a new approach to managing pests associated with cranberries and blueberries in Massachusetts. The program is focusing on the use of molecular genetics to reduce pesticide dependency in cranberry production. The research will be applicable to all cranberry research in states where cranberries are produced.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals of this research are to determine whether early emerging and late emerging dodder populations can be differentiated using molecular markers; to determine the relationships among several isolates of a fungus which might be used in biological control; to screen various plant pathogen fungi isolates for infectivity and virulence and determine the presence of genes in these isolates; and develop an in vitro assay system for root rot and induce resistance in cranberry plants caused by different isotypes of the fungus.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999 and the appropriation for fiscal year 1999 and 2000 was $150,000. A total of $300,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. There were no non-federal funds provided for this grant in fiscal years 1999 or 2000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being carried out at the University of Massachusetts Cranberry Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original

objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Since this began in fiscal year 1999, the original objectives have not yet been met.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project underwent a merit review at the agency level in January, 1999. Due to delayed funding of this project until July of 1999, research is just now starting on these objectives.

CRANBERRY-BLUEBERRY DISEASE AND BREEDING, NEW JERSEY

Mr. Skeen. Please provide a description of the research that has been funded under the Cranberry-Blueberry Disease and Breeding, New Jersey grant.

Response. The work has focused on identification and monitoring of insect pests on blueberries and cranberries, the identification, breeding, and incorporation of superior germplasm into horticulturally-desirable genotypes, identification and determination of several fungal fruit-rotting species, and identification of root-rot resistant cranberry genotypes. Overall, research has focused on the attainment of cultural management methods that are environmentally compatible, while reducing blueberry and cranberry crop losses.

Mr. Skeen. According to the research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. This project involves diseases having major impacts on New Jersey's cranberry and blueberry industries, but the findings here are being shared with experts in Wisconsin, Michigan, and New England.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was the development of cranberry and blueberry cultivars compatible with new disease and production management strategies. Over 75 blueberry selections with wild blueberry accessions resistant to secondary mummy berry infections have been moved into advanced testing identified. The biology and seasonal life history of spotted fireworm on cranberries has been determined. A pheromone trap-based monitoring system for cranberry fruitworm was developed and further refined for commercialization. Blueberry fruit volatiles attractive to blueberry maggots were identified and tested in the field. Researchers have planted over 4500 cranberry progeny for evaluation. Seven major fruit-rotting fungal species were identified, and their incidence in 10 major cultivars of blueberry and cranberry were determined. It is likely that resistance to fruit rot is specific to fungal species.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1985, $100,000; fiscal year 1986-1987, $95,000 per year; fiscal year 1988-1989, $260,000 per year; fiscal year 1990, $275,000; fiscal years

1991-1993, $260,000 per year; fiscal year 1994, $244,000; and fiscal years 1995-1999, $220,000 each year. A total of $3,209,000 has been appropriated

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. State and non-federal sources are providing funds in the amount of 250,000 each year.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at the New Jersey Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The completion date for the original objectives was 1995. Those objectives have not been met. To complete the breeding, disease and insect management and provision of new management guidelines for extension and crop consultants, it estimated that an additional five to nine years will be required.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted?

Response. The last agency evaluation of this project occurred in January, 1999. In summary, the evaluation stated that the effort has continued to be highly productive, with various improved management strategies, plant materials and environmentally-balanced pesticides being areas of major impact. Some specific accomplishments included continued evaluation of blueberry and cranberry germplasm for yield, color, fruit rot, and flavor; and development of an efficient plant regeneration system for cranberry for genetic transformation. Other research includes trap and lure development for monitoring the cranberry fruitworm and evaluation of several aphicides in blueberries. The discovery of an antisporulant in a registered fungicide provide for a novel use patent for blueberry anthracnose control.

CRITICAL ISSUES

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. These funds support research on critical issues related to new or emerging pests and diseases of animals and plants. The program is expected to initiate research in a short time period until other resources can be secured to address the issue. The program began in fiscal year 1996 when potato late blight and vesicular stomatitis in animals were the two targeted emerging problems chosen for funding. Funding for these two projects was continued with fiscal year 1997 funds to permit orderly conclusion of work leading to integrated pest management efforts for the potato late blight and for further surveys on wildlife reservoirs of the vesicular stomatitis virus. During fiscal year 1998 these funds were used for support of a project on a newly emerging corona virus strain that is a probable cause of severe outbreaks of shipping fever or pneumonia in transported beef cattle. For plant diseases, fiscal year 1998 funds were used to support two major research projects on a new disease of sorghum, Sorghum Ergot. The two projects were Epidemiology and Life History of Ergot and Development of Integrated Control

of Sorghum Ergot. In fiscal year 1999, Johne's Disease of cattle was identified by both veterinary researchers and APHIS animal disease control staff as a major issue. For plants in fiscal year 1999, research was supported on the insect vectored disease, Tomato Yellow Leaf Curl virus.

Mr. Skeen. What is the national, regional or local need for this research?

Response. Vesicular stomatitis was of national impact due to its similarity to foot and mouth disease and the negative effect on movement of horses, cattle and swine during an outbreak. Since 1992 new, highly virulent strains of the potato late blight fungus Phytophthora infestans caused severe losses in potato and tomato production throughout the United States, resulting in what some experts term a national crisis. From 1993 to 1995, a series of meetings involving growers, consultants, industry, academia and government assessed the growing problem and participants concluded that extraordinary steps were needed to mobilize research efforts that would help address the problem in the near term. Bovine shipping fever causes heavy economic losses to the beef industry in cattle being shipped to feedlots and vaccines for currently recognized viruses seem to be ineffective in certain settings in preventing outbreaks. The isolation of a probable new virus, bovine respiratory corona virus represents an opportunity to contribute to the reduction of this disease complex in cattle. Sorghum Ergot is a serious disease of sorghum which was first detected in Texas in March, 1997. It rapidly spread to almost all sorghum growing regions of the US by September 1997. Johne's Disease has been identified by several commodity and animal health organizations as the leading problem for dairy cattle owners and also a serious issue for beef producers. Decisions on specific research needs and focus of research projects is decided after consultation with a variety of commodity stakeholders, other USDA agencies, especially the Animal and Plant Health Inspection Service, scientists in the land grant system, and other public input. Tomato Yellow Leaf Curl virus is a newly introduced disease into Florida that has caused considerable crop loss. The disease moved rapidly over the entire state and now has moved into Georgia. This disease is vectored by the silver leaf whitefly and affects tomatoes, beans, and other vegetables. The disease symptoms are severe stunting, distortion, and high rates of flower loss.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research supported by this program is to focus on specific questions or issues which are considered to be most important in developing control or prevention programs for the disease agent under investigation, whether in plants or animals. Thus, for the animal studies, the focus has been on identifying natural reservoirs of the vesicular stomatitis virus and insects which are capable of transmitting the disease among animals; determining the precise significance of the apparent new corona virus in shipping fever pneumonia of beef cattle; and developing a sub-unit vaccine for Johne's Disease in cattle and determining the significance of a linkage between Johne's Disease and Crohn's disease of humans. In spite of a very large research effort, the natural reservoir for vesicular stomatitis virus is still unknown. The bovine respiratory disease work on the apparently new respiratory corona virus is expected to validate the role of this virus in outbreaks of pneumonia in cattle vaccinated for other known causes of shipping fever. Confirmation of such a fact will provide a basis for development of control measures including vaccine development. Research was initiated to provide growers with the knowledge and technologies they need to reduce economic losses resulting from potato late blight with less reliance on

pesticides. Research initiated with fiscal year 1996 funds is making progress in developing modeling tools and management approaches that are an important step towards reducing the devastating effects of late blight. The National Late Blight Fungicide Trial provided important information on the efficacy of an array of fungicide programs. A World Wide Web site was established to provide growers, researchers and industry with the latest information on management of potato late blight. The research projects on Sorghum Ergot were intended to develop information about the history and epidemiology of the disease which would lead to studies on development of integrated control programs for this fungus. Research on Tomato Yellow Leaf Curl Virus has aided in the understanding of which field crops other than tomato serve as a source of virus infection. Weed reservoirs were also studied as potential whitefly infection sites. These results will help in the development of field management strategies for this virus. Another research project tested transformed tomatoes that had been selected for resistance to Tomato Yellow Leaf Curl virus. This approach was successful in developing resistant tomatoes to another similar virus and is expected to produce highly resistant tomato varieties to Tomato Yellow Leaf Curl virus.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. $200,000 were appropriated in fiscal years 1996-2000 for a total appropriation of $1,000,000 to date. The fiscal year 2001 budget proposes an increase of $267,000 for a total of $467,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This information should be available within 30 days.

Mr. Skeen. Where is this work being carried out?

Response. From 1996 to 1997, the vesicular stomatitis work was conducted at the University of Arizona and Colorado State University. The potato late blight work has been conducted at Washington State University, Oregon State University, University of Idaho, University of Wisconsin, and Pennsylvania State University, and North Carolina State University. In 1998 the bovine respiratory disease work was performed at Louisiana State University. The Sorghum Ergot work is being done at the University of Nebraska and Texas A&M University. In 1999 the research on Johne's Disease has been performed at Iowa State University and the University of Iowa. The research on Tomato Yellow Leaf Curl Virus was carried out at the Gulf Coast Research and Education Center, University of Florida, Bradenton, FL and the Tropical Research and Education Center, University of Florida, Homestead, FL.

Mr. Skeen. What was the anticipated date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Critical Issues funds are intended to support the initiation of research on issues requiring immediate attention until other, longer-term resources are available. The objectives of the projects are short-term and are expected to be completed within a 1-2 year period. This has been true for the vesicular stomatitis and potato late blight work. These projects have been reviewed to ensure compliance with the original goals during fiscal year 1997.

The subsequent project grants for potato blight in 1997 and for Sorghum

Ergot and bovine respiratory disease in 1998 had short term goals and are expected to be completed by the end of their project years which will occur in late spring 1999. Similarly, the objectives of the research funded with fiscal year 1999 funds are expected to be completed by the summer of 2000. For the Johne's Disease work, the emphasis is on determining the likelihood of a link between this disease of cattle and Crohn's Disease in the human and also developing a vaccine to prevent further spread within the cattle population. For Tomato Yellow Leaf Curl Virus, the emphasis is on field management of the disease and the development of virus resistant varieties of tomato.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. All projects were reviewed for scientific merit before funding decisions were made. Also, scientists being supported with these funds are in close contact with CSREES' National Program Leaders in these areas so that the agency is kept abreast of developments as they occur. Each investigator is required to submit a detailed report at the end of the funding period to document their accomplishments with these funds. In addition, site visits are arranged when convenient to include as part of other official travel to that state. The vesicular stomatitis research had a site visit review in early 1998 and was reviewed as a completed project in March, 1999 during a program review at the University of Arizona. The final results of the bovine respiratory work were submitted to CSREES for review in early fall, 1999. The plant related projects have received similar reviews as the projects have moved forward, and the results are being reported at regional and national meetings.

DAIRY AND MEAT GOAT RESEARCH, PRAIRIE VIEW A&M, TEXAS

Mr. Skeen. Please provide a description of the research that has been funded under the dairy goat research grant?

Response. The program has addressed a range of issues associated with goat production. Research by scientists at the International Dairy Goat Center, Prairie View A&M University focuses on problems affecting goat production in the United States. Issues included are the study of nutritional requirements of goats, disease problems, methods to improve reproductive efficiency in the doe, the use of gene transfer to improve caprine genetics and the evaluation of breeding schemes to improve meat and milk production. Currently, research is in progress to assess the economics of alternative breeding and rearing systems for goats in the southeastern region of the U.S., to study the incidence and impact of intestinal parasites, and to develop least-cost health management strategies for parasite control.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that nationally, most of the farm enterprises that include goats are diverse and maintain a relatively small number of animals. Responding to disease, nutrition, breeding and management problems will improve efficiency of production and economic returns to the enterprise.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to conduct research that

will lead to improvement in goat production among the many small producers in the United States. Research has been conducted to develop and improve nutritional standards, improve genetic lines for meat and milk production and to define mechanisms that impede reproductive efficiency in goats. Current efforts focus on the development of enterprise budget management tools for goat producers in the Texas gulf coast region.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded through appropriated funds as follows: $100,000 per year for fiscal years 1983-85; $95,000 per year for fiscal years 1986-88; no funds were appropriated in fiscal year 1989; $74,000 for fiscal year 1990; $75,000 per year for fiscal years 1991 - 1993; $70,000 for fiscal year 1994; and $63,000 per year for fiscal years 1995-2000. A total of $1,332,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The University reports no non-federal funds expended on this program.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Prairie View A&M University in Texas.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The overall objective of this research is to support the needs of small farms engaged in the production of meat and milk from goats along the Texas Gulf Coast. The University researchers continue to address those needs on an annual basis and anticipate that work currently in progress will be completed by the end of fiscal year 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Dairy/Meat Goat Research grant was reviewed last in June 1997. The project objectives are within the goals of the program, are within the mission of both USDA and CSREES, and the institution is well equipped and qualified to carry out the research project.

DELTA RURAL REVITALIZATION, MISSISSIPPI

Mr. Skeen. Please provide a description of the program that has been funded under the Delta Rural Revitalization, Mississippi Project?

Response: The Delta Rural Revitalization, Mississippi Project involves applied research and outreach focused on creating new and expanded economic development opportunities for the Mississippi Delta region. The project has gone through several phases in the delineation of a strategy for long range development within the region. Phase I was completed with the delivery of a baseline assessment of the economic, social, and political factors that enhance or impede the advancement of the region. Phase II of the project evaluated the potential for entrepreneurship and small business creation as

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mechanisms to improve economic conditions. Phase III is now focusing on technical assistance to Delta region manufacturing firms to strengthen their ability to provide employment and incomes and includes the development and refinement of data bases and development statistics. The proposals are submitted for internal review and evaluation within the agency. Recommendations are presented to enhance impact on regional and national agendas and provide greater impact on targeted region.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This is an on-going pilot to demonstrate the effective development and implementation of applied research, training, education, and technical assistance related to job and business development as a development strategy. The principal researcher believes that the databases, technical assistance, and analytical capability will increase the effectiveness of economic development and entrepreneurial activity in the region.

Mr. Skeen. What was the original goal of this research and what has been accomplished?

Response. The applied research and outreach project was designed to increase the ability to guide economic development strategically through target industry attraction. They developed an analytical baseline for the Delta region to benchmark economic development progress and to profile potential arenas of opportunity. An entrepreneurial forum was established to help new business ventures with start-up advice and assistance. A venture capital association was formed to help both inventors and businessmen find capital resources to carry out development initiatives. The emphasis of the project is now shifted to technical assistance for existing industries.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from appropriated funds in the following amounts per year: FY 1989, $175,000; FY 1990, $173,000: FY's 1991-93, $175,000 per year; FY 1994, $164,000: FY's 1995-2000, $148,000 per year. A total of $1,925,000 has been appropriated and awarded.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Total non-federal funds from the State of Mississippi directed to this project, as reported by Mississippi State University, are: FY 1991, $117,866: FY 1992, $84,402; FY 1993, $68,961; FY 1998, $57,404. Reports for other years indicate no non-federal funds.

Mr. Skeen. Where is this work being carried out?

Response. Applied research and outreach is being carried out through Mississippi State University and sub-contractors.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original completion date was September 30, 1990. The original objectives of this research have been met. The additional objectives being presented for the current year should be completed by September 30,

2000. The current year proposal has not been submitted to date.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency evaluates the merit of research proposals as they are submitted. No formal evaluation of this project has been conducted. The principal investigators and project managers submit periodic reports to the agency to document the impact of the project. Significant suggestions have been offered to improve the relevance and impact of this project. Time lines tend to lag on targeted accomplishments. An assessment of the project was conducted by the Social Science Research Center at Mississippi State University and a report compiled in November, 1996. A site review was conducted in April, 1999, to assess the merits of research efforts underway. A review and evaluation by an outside consultant is currently underway.

DESIGNING FOODS FOR HEALTH, TEXAS

Mr. Skeen. Please provide a description of the research that has been funded under the Designing Foods for Health, Texas grant.

Response. Designing fruits and vegetables for improved health and nutrition is the overall goal. Health scientists have documented that naturally occurring compounds such as flavonoids, carotenoids, and antioxidants, have health benefits to prevent heart disease, stroke, and some forms of cancer. The research objective is to develop fruits and vegetables that have uniform, high levels of these compounds so all consumers can prevent chronic diseases through their diet. The fiscal year 1999 grant supports research through June 2000. CSREES requested the university submit a grant proposal for fiscal year 2000 that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to improve the quality and health-related benefits of fruits and vegetables. Health scientists have documented that fruits and vegetables have naturally occurring compounds that promote health and prevent disease. The medical community advocates that preventing disease is more advantageous than trying to cure it. For example, a large effort of Texas health science centers is to develop improved diets that can aid in prevention of colon, esophagus, and prostate cancers. Improved fruits and vegetables for health will provide an enormous benefit for consumers worldwide.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to design fruits and vegetables that assist in preventing diseases through diet. The most exciting accomplishment has been the development of the new carrot, BetaSweet. It was designed to be attractive, crisp in texture, have excellent sweet carrot flavor, and to contain a higher content of beta-carotene than most orange carrots in the marketplace. Beta-carotene is a major source of Vitamin A and is thought to play additional roles in preventing certain forms of cancer, especially oral cancer. This carrot also contains high levels of anthocyanins that are normally found in fruits. They are known to be excellent antioxidants that prevent blood clotting, aid in the prevention of some cancers, heart disease, and strokes. The researchers are also improving health promoting aspects of the BetaSweet carrot by adding lycopene, which is

found in tomatoes. All these improvements are being done using conventional breeding.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999, and the appropriation for fiscal year 1999 was $250,000 and fiscal year 2000 was $318,750. A total of $568,750 has been appropriated.

Mr. Skeen. What are the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were $206,500 from university funds and $165,000 from an endowment fund in 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the Vegetable and Fruit Improvement Center and other locations within the Texas A&M University System.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original overall objective of developing fruits and vegetables that contain high levels of naturally occurring compounds that have health benefits continues to be addressed. The specific objective of improving the carrot by increasing the carotenoid and anthocyanin content while maintaining superior flavor and textural properties will be completed in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project director conducted a review by peer scientists at Texas A&M prior to submitting the proposal for fiscal year 1999. The Vegetable and Fruit Improvement Center has a very active advisory board which reviews the Center's research programs annually.

DIAPREPES / ROOTWEEVIL, FLORIDA

Mr. Skeen. Please provide a description of the research that has been funded under the *Diaprepes*/Rootweevil grant.

Response. The funds are requested to address objectives established by an interagency/industry task force, as follows:

- Assessment of the plant injury and economic damage caused by the root weevil on horticultural, agronomic and ornamental plants in the affected area, and the potential for the pest to spread beyond its current range;

- Development and use of monitoring tools to evaluate population levels, regions infested, and to predict where economic damage is likely to occur. Since the pest's most damaging stages, the larvae, feed on roots, damage is not evident, and thus monitoring for the presence of the weevil and assessing population levels is most difficult;

- Development, field evaluation and implementation of management tools that individually will assist in reducing populations or the impact of their presence, and collectively, will serve as the basis for inclusion of weevil management into existing pest management programs in citrus and other affected crops. These tools also are being suggested as strategies important to management of containerized plant material, ornamentals and fruit trees, so that the weevil is not moved beyond its current area of infestation into other states and regions. Included in the tools to be developed are chemical, biological, cultural and mechanical methods.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. *Diaprepes abbreviatus* is a pest introduced into Florida from its native Caribbean Islands in the late 1960's, but remained very localized in few citrus groves until the late 1980's when for unknown reasons, the pest began to spread, helped by movement of potted plant material and other mechanical spread methods. Known as a serious pest of a wide range of plants, from grasses, including Bermuda grass, to legumes, fruit trees and a large number of ornamental plants, this pest has the potential to not only affect traditional agricultural environments, but also native plants and can cause enormous economic losses in the home landscape, a multi-billion dollar industry in Florida and the Southeast. Further movement could expand the impact of this pest to other areas of the United States, and could invoke regulatory concerns between trading partners and commerce. Currently, there is no known tool or collection of tools that effectively limits population growth of the pest, and thus, there is no remedy for this pest at present. Development and evaluation of methods to locate and reduce larval populations must rely on a combination of treatments that are effective, safe, and economical. At present, those infested with the pest must stand by and watch the trees decline.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to develop and deliver strategies to eliminate further spread and maintain viable plant health in the presence of the pest. Since it was first funded in 1999 progress towards attainment of the goal is still being assessed.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Fiscal year 2000 is the first year of the grant and $297,500 has been appropriated for fiscal year 2000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Numerous investments will continue to be made in this research. University of Florida has several programs who have focused their efforts on *Diaprepes* research, including the entomologists, pathologists and plant improvement teams. Internal funds as well as effort have been redirected to address this problem. Likewise, United States Department of Agriculture, Agricultural Research Service scientists at several locations in the Southeast have been assigned to this research and internal funding is being utilized to address this problem. The citrus growers of Florida have dedicated considerable grant dollars from a self-tax for research, and more recently, other commodity groups are contributing to fund research. In-kind support

through cooperation, shared equipment and other means are being offered to address the issue. However, the speed with which the pest has spread and the increasing economic impact has outpaced the current allocation of resources, and the economic losses are rising.

Mr. Skeen. Where is the work being carried out?

Response. The work is being carried out at the University of Florida at Gainesville.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The plan for the work will be submitted with the research proposal.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This is a new project for which an evaluation has not been conducted

DROUGHT MITIGATION, NEBRASKA

Mr. Skeen. Please provide a description of the research that has been funded under the Drought Mitigation grant.

Response. The National Drought Mitigation Center in the School of Natural Resource Sciences at the University of Nebraska has a comprehensive program aimed at lessening societal vulnerability to drought. Activities of the Center include promoting and conducting research on drought mitigation and preparedness technologies, improving coordination of drought-related activities and actions within and between levels of government, and assisting in the development, dissemination, and implementation of appropriate mitigation and preparedness technologies in the public and private sectors. Emphasis is directed toward research, outreach projects and mitigation/management strategies that stress risk minimization.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The Federal Emergency Management Agency has recently estimated that annual losses attributable to drought in the United States are between $6-8 billion. Drought impacts are escalating in response to increasing demands for water and other natural resources, increasing and shifting population, new technologies, and social behavior. These impacts are diverse and affect the economic, environmental, and social sectors of society. This fact was reinforced dramatically in 1996 in the Southwestern United States. Impacts in Texas alone were estimated to be more than $5 billion.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to create a National Drought Mitigation Center and develop a comprehensive program aimed at lessening societal water shortages and vulnerability to drought. The Center has created an information clearinghouse and is delivering information to a diverse audience of users through its home page. Over 50,000 users now access

the Center's home page each month. The Center's award winning home page was used extensively by state and federal agencies during the 1999 drought to assist in the evaluation and response process. This home page networks users of drought-related information in the United States and elsewhere with information that would otherwise be unavailable or inaccessible to users.

The National Drought Mitigation Center played an important role in the response of federal and state government to the 1996 severe drought in the Southwest and southern Great Plains states. In addition to providing timely and relevant information on drought severity and alternative response, mitigation, and planning measures, the Center participated in the Multi-state Drought Task Force workshop organized at the request of President Clinton and helped formulate long-term recommendations to improve the way this Nation prepares for and responds to drought. The Center is also a member of the Western Governors' Association Drought Task Force. This Task Force made recommendations to reduce the risks associated with drought in the western United States.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant received an appropriation of $200,000 in fiscal years 1995 through 2000, for a total appropriation of $1,200,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The University of Nebraska contributed $75,737 of non-federal funds in support of this research in fiscal year 1995, $58,977 in fiscal year 1996, and $61,545 in fiscal year 1997. The University of Nebraska contributed $67,819 in fiscal year 1998, and $74,887 in fiscal year 1999.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted at the University of Nebraska-Lincoln.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The research conducted under this project is being undertaken within a series of nine tasks. Significant progress on each of these tasks has been made, but these activities are ongoing. The information clearinghouse has been created, but new information and documents are continuously added to the home page in response to users' needs and requests. In addition, the drought watch section is updated monthly to assist users in evaluating current climate and water supply conditions. Research on new climatic indices to monitor drought and water supply conditions are being tested and mitigation technologies and existing state drought plans are continuously evaluated. New activities are also being initiated in response to the growing interest and awareness in drought mitigation in the United States and elsewhere. The activities of the Western Drought Coordination Council provides the Center with a broadening range of research needs on an annual basis.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was peer-reviewed at the time the proposal was prepared in 1998. Each year when the new proposal is prepared, the proposal is reviewed on the campus and again at CSREES. The project is evaluated for progress toward completion of objectives, new activities proposed and accomplishments.

ECOSYSTEMS, ALABAMA

Mr. Skeen. Please provide a description of the research that has been funded under the Ecosystems, Alabama, grant.

Response. In 1998, CSREES approved a proposal from Auburn University to support projects at two Community Colleges in Alabama— Faulkner State Community College and Alabama Southern Community College. The Faulkner State Community College's project is intended to: (1) fund the development of distance education classrooms for estuarine- and marine-related education, and (2) to establish an aquaculture-related veterinary technician education program. The Alabama Southern Community College project will purchase and install laboratory equipment to further the education capacity of the Center for Excellence in Forestry, Paper, and Chemical technology.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the local, regional, or national need for this project?

Response. Faulkner State Community College asserts that their veterinary technician program will be the only such program in the country, providing the first two years of the degree program leading to an A.A. degree at Faulkner State, and the second two years leading to a bachelor's degree at Auburn University. The distance education capacity is intended to better integrate marine and estuary research into education activities.

The Center for Excellence in Forestry, Paper, and Chemical Technology at Alabama Southern Community College is believed to be a unique educational opportunity in the Southeastern United States due to the merging of four individual technology training programs. These programs are: (1) Industrial Maintenance, (2) Electronics and Instrumentation, (3) Paper Process, and (4) Chemical Process training.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals for these projects include the development of a veterinary technician training program and integration of marine and estuary research into classrooms at Faulkner State Community College; and to establish a state-of-the-art wood paper process and chemical process laboratory at Alabama Southern Community College.

The fiscal year 1998 objectives for Faulkner State College were to establish a distance education web to enhance integration of marine and estuarine environmental research and to establish a 2+2 veterinary technician program with an emphasis on marine/aquaculture. The distance education web is in place and has been tested. In addition, classrooms have been tested and some faculty have been trained in the use of the media/hardware. After further assessment, it was decided that the proposed Veterinary Technician Program would not be cost effective. With the fiscal year 1999 proposal, Faulkner proposed instead, to establish a 2+2 Environmental Science degree program.

The fiscal year 1998 objectives for Alabama Southern Community College was

to have completed, tested, and placed into operation the chemical, pulp, and paper process laboratories in the areas of 1) Process Control, 2) Crystallization, 3) Batch Reactor, and 4) Digester by June, 2000. The Process Controls laboratory is nearly complete. The others are under design and the project is on-line for completion as originally proposed.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Funds were appropriated for this grant beginning in fiscal year 1998. In fiscal years 1998, 1999 and 2000, $500,000 was appropriated each year. A total of $1,500,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided to support this project?

Response. No non-federal funds have been identified to support this project.

Mr. Skeen. Where is this work to be carried out?

Response. The project will be conducted at the Faulkner State Community College Aquaculture Center in Alabama and at the Alabama Southern Community College Center for Forestry, Paper, and Chemical Technology.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Alabama Southern Community College project proposal indicates a two year budget for project completion. The Faulkner State Community College proposal was for one year only. The objectives have not yet been met but are well underway.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project had a merit review before it began in fiscal year 1998. Subsequent projects were peer reviewed by the respective institutions for the fiscal year 1999 allocation.

ENVIRONMENTAL RESEARCH, NEW YORK

Mr. Skeen. Please provide a description of the research that has been funded under the environmental research grant.

Response. The environmental research in New York has several major goals. These are: 1) to better understand the impacts of nutrient flows, principally nitrogen, from agriculture on non-agricultural ecosystems, forests, wetlands, and water resources in mixed ecosystem landscapes; 2) to improve knowledge of agricultural contributions to greenhouse gas emissions and effects of projected climate change on crop production; and 3) to develop innovative approaches and technologies for improving the efficiency of agricultural production. New thrusts include: 1) to improve understanding of the impacts of land application of biosolids on the sustainability of New York agriculture and on water quality, and to develop management practices and guidelines for sustainable use of biosolids in New York agriculture; and 2) to evaluate spatial and temporal variability of crop yields within fields and to develop

management practices that increase productivity, increase the efficiency of use of inputs, and reduce environmental impacts of agriculture.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Programs supported by the special grant are multidisciplinary in nature, involving technical scientists from a range of disciplines, together with social scientists and economists. Due to the complexity of agriculture and environmental interactions at all levels, the needed research is complex and requires much time. Additionally, translation of knowledge from plot or field studies to larger scales, such as landscape to regional and global, is needed to provide information that is useful to policy makers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. One goal of the program is to identify impacts of nitrogen flows from agricultural lands on adjacent natural ecosystems, forests and wetlands, and water resources, and to devise management strategies to minimize these impacts.

Leaching of nitrogen from maize based cropping systems has been shown to be higher when organic sources of nitrogen, manures and plow-down alfalfa, are used as nitrogen sources for crop growth compared to use of inorganic fertilizers. A computer-based nitrogen decision support system to improve recommendations for on-farm nitrogen management is being used in New York.

A second goal of the program is to investigate several interactions between agriculture and climate change. Studies of methane fluxes to/from soils showed that northern hardwood forests are both a source and a sink for this powerful greenhouse gas and overall may be a net source of methane. In contrast, upland agricultural systems were consistently found to be a sink for methane. Use of legume green manures to supply nitrogen in an organic production system increased methane emissions two-fold, creating a conflict between a sustainable agriculture practice and the environment.

No-tillage agriculture was shown to increase preservation of existing soil organic carbon but accumulation of carbon derived from crop inputs was higher with conventional tillage. Inputs of carbon to soils from root exudates and residues were found to be more important to carbon sequestration in soils than were residues from the tops of plants.

Soil quality assessments at the Chesapeake farms sustainable agriculture project on Maryland's Eastern shore, where various cropping systems are being compared with the conventional corn-soybean rotation, have shown that soil quality improves as the cropping system becomes more complex, involves less tillage, and has more organic inputs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 with an appropriation of $297,000. The fiscal years 1992-1993 appropriation was $575,000 per year; $540,000 in fiscal year 1994; and fiscal years 1995 through 1999, $486,000 each year. The appropriation for fiscal year 2000 is $400,000. A total of $4,817,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by

fiscal year?

Response. In fiscal year 1991, Cornell University provided $27,893 and the State of New York provided $118,014. In fiscal year 1992, Cornell University provided $37,476 and the State of New York $188,915. In fiscal year 1993, Cornell University provided $13,650 and the State of New York $243,251. In fiscal year 1994, the State of New York provided $214,989. In fiscal year 1995, the State of New York provided $233,085. In fiscal year 1996, the State of New York provided $388,301. In fiscal year 1999, the State of New York provided in excess of $400,000 to support this research.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at Cornell University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original estimate was for a 5-year program and many of the initial objectives in the nitrogen and climate change areas have been met. New objectives evolved from the original work and the program was also oriented to consider broader dimensions of environmental management, particularly strategies for community-based watershed management, involving linkage of technical knowledge with social and local governmental perspectives and needs. Estimated completion dates for current program elements are:

Completion beyond 1999:

- Watershed science and management
- Effects of elevated carbon dioxide on crop yield potential
- Remington farms sustainable agriculture project--a 10-year project
- Carbon storage in soils

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was peer reviewed in 1997 and 1998. Overall, the project was rated very high. Specific ratings included the following:

1. Outstanding scientific merit.
2. Appropriate methodology.
3. Excellent previous accomplishments.
4. The project has potential for significant impact concerning the relationship of agriculture to global change.
5. The proposal is well conceived and well written.

ENVIRONMENTAL RISK FACTORS/CANCER, NEW YORK

Mr. Skeen. Please provide a description of the work that has been funded under the Environmental Risk Factors/Cancer, New York, grant.

Response. The agency has requested the University to submit a renewal grant proposal.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, and local need for this research?

Response. The American Cancer Society estimated that approximately 175,000 women in the United States will be newly diagnosed with breast cancer

during 1999 and that 43,000 will die from this disease. The role of environmental risk factors, such as pesticides, is of concern to women, the agricultural community, and policymakers. This project, emphasizing risk reduction information, will work at filling that void.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original and continuing goals of this research are:

1. To establish and expand the database of Critical Evaluations on the current scientific evidence of carcinogenicity for selected agricultural chemicals. This will include writing Critical Evaluations on the breast cancer risk of chemicals used in agricultural settings and the role of selected agrochemicals in childhood cancer.

2. To communicate effectively information in the database to a variety of audiences, including the scientific community, federal agencies, public health professionals, the agricultural community aid the public, using printed materials and electronic formats on the internet.

3. To ensure that the public will have access to science-based information written in non-technical language about environmental factors and the risk of breast cancer and childhood cancers.

4. To increase the knowledge and use of practical strategies aimed at breast cancer risk reduction for residents in rural areas. Efforts to address this objective will include: a) simple, attractive, printed educational materials tailored for families in rural areas; 2) videotape-based educational workshops for use with groups of rural women.

5. To effectively incorporate breast cancer risk reduction messages into health care and health screening settings in rural areas. This will include enhancement and adaptation of the BCERF interactive computer display, developed in this current project year, for use in health care settings and at cancer screening events in rural areas.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997, and in fiscal years 1997, 1998 and 1999 $100,000 was appropriated per year, and in fiscal year 2000 $170,000 was appropriated for a total of $470,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows:

- - $150,000 New York State appropriations for fiscal year 1996
- - $250,000 per year in New York State funds was provided for fiscal years 1977 and 1998.

- - $350,000 in New York State funds for 1999 and the same requested for fiscal year 2000.

Mr. Skeen. Where is the work being carried out?

Response. This research and outreach is conducted at Cornell University. Ithaca, NY.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date or additional or related objectives?

Response. This was a new project which began in April 1997. Because of the success of meeting the original objectives in NYS, BCERF efforts are being continued and directed toward regional efforts. The anticipated completion date is June 30, 2001.

Objectives met:

1. The bibliographic database was established during year one and is updated and expanded each year. It currently has over 4,000 entries with over 250 added each quarter. Also, it includes full bibliographies of all pesticide and dietary/lifestyle scientific critical reviews.

2. Critical Evaluations: the breast cancer risk of seven pesticides--four in fiscal year 1997, three in fiscal year 1998--have been completed. The completion of two additional Critical Evaluations is anticipated by the end of the current fiscal year.

3. Science-based information material -- fact sheets -- have been developed for the seven pesticides and for four pesticide-related issues. Also, four fact sheets were developed on diet/lifestyle breast cancer risk factors, and three on general information on breast cancer. Eight additional fact sheets are to be developed in the current fiscal year.

4. Two video teleconferences and an in-service have been held and evaluated. Follow-up telephone surveys of 1997 facilitators at BCERF satellite video conference downlink sites and participants at the June 1997 on-campus training program was completed, and an analysis of response data was initiated.

5. The interactive computer Rural Exhibit was completed in 1999 and evaluated during Summer/Fall 1999.

6. Tile BCERF website was revamped in 1997-1998 and relaunched in September 1998. The number of browsers accessing tile BCERF home page rose from 380 to 450 hits per month during the summer of 1998 to 1,053 hits in November 1998 and 3,490 hits in December 1998. Hits remain high with an average of about 3,000 per month.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. As a relatively new project, a complete evaluation has not been conducted, although the proposal is currently under review. Periodic progress reports have been made throughout the year. The project is moving towards achieving its desired goals. A final evaluation will be made after June 30, 2001. BCERF has evaluated most components of the program, with further evaluation planned. To date, BCERF has done an evaluation of the video teleconferences and in-service and has had the pesticide fact sheets reviewed by focus group -- breast cancer survivors and women not having breast cancer. The participants brought a variety of perspectives to the discussion, providing BCERF with a wealth of important feedback on fact sheets and educational approach. Some of the conclusions drawn from this evaluation have

already resulted in simple changes made in the preparation of current fact sheets. Other feedback from this evaluation will inform planning efforts for the education component in general.

Evaluation played a key role in the development of the interactive computer rural exhibit. To develop the exhibit, qualitative and quantitative information was gathered about the knowledge, attitudes and beliefs of rural women regarding environmental risk factors and breast cancer. In addition, BCERF conducted brief surveys of rural women attending several rural conferences and events. The complete exhibit was tested at two farm shows and the New York State Fair in Fall 1999, partnering with professionals and organizations, such as those providing mobile mammography.

To evaluate the value of Critical Evaluations to scientists and federal agency personnel, a fax-back survey has been sent. The majority of respondents 88 percent so far have found the Critical Evaluations to be relevant to their work.

ENVIRONMENTALLY SAFE PRODUCTS, VERMONT

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. Cooperative State Research, Education, and Extension Service has requested the university to submit a grant proposal that has not yet been received. The research will address the development of an environmentally friendly wood finish formulated with whey, a protein-based biopolymer that can replace standard polymer finishes that emit volatile organic compounds.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research addresses a national need to find alternative wood finishing products that are nontoxic and environmentally preferable.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This grant is new and the research will build upon existing expertise to offer new products with good performance for use in the furniture and toy manufacturing industries.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $170,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new grant and since the proposal has not yet been received, the source and amount of non-federal funds for this research is not known.

Mr. Skeen. Where is this work being carried out?

Response. This work will be carried at the University of Vermont.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met: What is the anticipated date of additional or related objectives?

Response. This project is expected to be completed in three years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the evaluation conducted.

Response. Since this is a new grant, no evaluation has been conducted.

EXPANDED WHEAT PASTURE, OKLAHOMA

Mr. Skeen. Please provide a description of the research that has been funded under the Expanded Wheat Pasture, Oklahoma grant.

Response. This project was designed to develop improved supplementation programs and new systems for technology delivery to reduce production risk of raising cattle on wheat pasture. The work involves evaluation of grazing termination date on grain and beef production, assess the impact of wheat cultural practices, and develop an economic model to evaluate alternative decisions on grain/beef production. Additional effort is directed toward development of cool season perennial forage grasses to complement wheat pasture. The proposal for fiscal year 2000 has been requested.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that this work addresses the needs of wheat/cattle producers of Oklahoma as a primary focus. However, it would appear to have application regionally in adjacent wheat growing states.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to develop economically-viable management systems for use of wheat for supplemental pasture for beef cattle before the crop starts making grain. This work has already shown how the use of feed supplements can increase net profit from cattle grazing on wheat pasture. The study has identified management practices, e.g. date of planting, cultivar selection, grazing intensity, and date of cattle removal that produce the optimum grain yield and cattle gain. A Wheat/Stocker Management Model has been developed as a decision aid to help producers assess income risk in the operation. Work is underway on a Wheat Grazing Systems simulation model.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1989 and appropriations were as follows: fiscal year 1989, $400,000; fiscal year 1990, $148,000; fiscal year 1991, $275,000; fiscal years 1992-1993, $337,000 per year; fiscal year 1994, $317,000, and fiscal years 1995 to 2000, $285,000 each year. A total of $3,524,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were

as follows: $175,796 state appropriations in 1991; $174,074 state appropriations in 1992; and $236,584 state appropriations in 1993. The non-federal support for 1994 was $238,058 for state appropriations. Funds for 1995 were $275,426, for 1996 were $120,000, for 1997 were $190,510, for 1998 were $224,500, and for 1999, $222,650.

Mr. Skeen. Where is this work being carried out?

Response. The research is being done at Oklahoma State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This project started in 1989 with a projection of 10 years to complete the research objectives. Some objectives are nearing completion while others will require further study. A number of wheat cultivars have been identified which will tolerate grazing and still produce economic grain yields. The grazing cut off date for grain production has been established. However year to year variation need additional study in order to develop a reliable decision support system. The revised projected completion date is 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This program is reviewed annually. Each year's funding cycle is peer reviewed internally and by the agency National Program Leaders for scientific merit and relevance. Results from this project are currently being used by ranchers to help with management decisions concerning stocker cattle grazed on wheat that will be harvested for grain. Current work is designed to refine the current information and identify wheat cultivars and grazing management for optimum economic return.

EXPERT IPM DECISION SUPPORT SYSTEM

Mr. Skeen. Please provide a description of the research that has been funded under the Expert Integrated Pest Management Decision Support System grant.

Response. A prototype information and decision support system was developed in collaboration with Purdue University and the Department of Energy's Argonne National Laboratory that integrates and manages information from multiple data sources. Development of this system now continues with the National Science Foundation Center for Integrated Pest Management at North Carolina State University. Components of the Pest Management Information Decision Support System include information on the United States Environmental Protection Agency review status of pesticides, crop losses caused by pests, status of minor use registrations, current research in progress, and priorities of integrated pest management implementation teams.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The Pest Management Information Decision Support System is fully operational and serves national, regional, and local needs for research and extension activities. The Food Quality Protection Act has been the driving force for the development and usage of this software program. At the national level, the system provides rapid access for the United States

Department of Agriculture, and Environmental Protection Agency helping to address pest management concerns and information to support the regulatory decision making process. It provides a mechanism for decision transparency and for all stakeholders to interact with the priority setting process. The ultimate result will be to help insure that farmers have adequate alternatives for managing pests at the specific local level.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the Pest Management Information Decision Support System was to refine the process of identification for Integrated Pest Management needs of the United States Department of Agriculture, the Environmental Protection Agency, and states. This goal reinforces the state and federal partnerships to disseminate important pest management information for improved decision making and environmental quality, and to address future needs. In 1996 and 1997, the program addressed and responded to the Memorandum of Understanding and supplemental Memorandum of Understanding between the United States Department of Agriculture and Environmental Protection Agency. The supplemental Memorandum of Understanding was signed in April, 1996, at which time there were 58 pesticides and 374 uses identified and prioritized. Twenty-five minor use crops were identified in the 1997 Pest Management Alternatives Request For Proposals as crops-at-risk due to regulatory actions. Results were also used to establish priority work identified for support by the regional Integrated Pest Management grants program Request For Proposal.

The Pest Management Alternatives Program Work-Bench of the Pest Management Information Decision Support System was beta tested in 1999 and has been delivered to the public domain and the present product (data base access) is available on the world wide web at <http://dsslab.cs.gmu.edu/PMIDSS>. Pest Management Information Decision Support System had undergone a complete rewrite during this last year. It has now been rewritten, using Java and Cold Fusion Structured Query Language queries, with all data now stored on a Structured Query Language Windows NT server. This means that no software other than the standard browser is required to access the information.

The Pest Management Information Decision Support System user interface has also been completely rewritten. It is a much friendlier interface, that allows users to search a multitude of specific pest management databases, either concurrently or separately, by crop, pest and/or tactic and retrieve data summaries or the entire record from all of the databases included. Each database now has a specific explanation of its source, the information contained within, and when last updated. Finally an automated update retrieval from many of the database sites such as the Inter-regional Project-4, Pipeline, Crop Profiles, and National Center for Food and Agricultural Policy Pesticide Use Database has been developed.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This work began in 1994 with development of the concept and design, and has proceeded through steps including database identification and specific development of a prototype and software. Current development have brought the product to the web and provides multiple database search capabilities for ease of data access. In fiscal year 1994, we expended $40,000 of Cooperative State Research, Education and Extension Service administrative funds and $90,000 from Science and Education Evaluation Funds to initiate collaborative work with the Argonne National Laboratory. In

fiscal year 1995, we expended $172,000 as a Cooperative Agreement with Purdue University and Argonne National Laboratory from the Pest Management Alternative Special Grant Funds and $5,000 from Pesticide Impact Assessment Program funds. In fiscal year 1996, we expended $177,000 in a cooperative agreement with Purdue University and Argonne National Laboratory from Pest Management Alternative Special Grant Funds, $21,000 from Research, Education and Economics Mission area Evaluation Funds, and $40,000 from Pesticide Impact Assessment Program. In fiscal year 1997-1998 we expended $165,425 and $177,000 to Purdue University and Argonne National Laboratory. In fiscal years 1999 and 2000, we are expending $177,000 to North Carolina State University center for Integrated Pest Management to implement, enhance and maintain the web-based system and provide access to multiple databases.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. It is difficult for us to estimate the amount of non-federal funds supporting the Pest Management Information Decision Support System. Purdue University, Cornell University and North Carolina State University have contributed non-federal resources in the form of dollars and personnel time. The National Science Foundation Center for Integrated Pest Management at North Carolina State University is supported in large part by corporate funds, part of which have underwritten Center personnel salaries. The informational data bases, which are accessed by the Pest Management Information Decision Support System, have been developed and generated by states and universities and represent considerable investments in time and resources.

Mr. Skeen. Where is this work being carried out?

Response. Presently, the bulk of the work is carried out in Washington, D.C. and in Raleigh, North Carolina. Cooperative State Research, Education and Extension Service has National Program Leaders in Integrated Pest Management, Pesticide Impact Assessment Program, and Inter-regional Project-4 program areas working on the Pest Management Information Decision Support System. The Center for Integrated Pest Management at North Carolina State University manages the web server where the pest management information system is located and is developing the multiple concurrent database search and decision support capability. Interaction and information is provided by every state in our system. We are in the process of strengthening the role of Land Grant partners in this program and additional database access is being developed through the Center for Integrated Pest Management, at North Carolina State University and through a sub-contract with George Mason University.

Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Our original estimate in 1994 was two-to-three years with adequate resources to complete developmental work. However, the design considerations became more complex with the 1996 passage of the Food Quality Protection Act requiring an expansion and change in information data bases. In addition, advances in web technology has greatly expanded the potential and use of the system to all people wanting information on pesticide use and pest management alternatives. Additional databases have been added to both the data access and decision support aspects of the project. The Pest Management Information Decision Support System team is now working directly with many data providers and users, including Inter-regional project 4, National Agriculture Statistics Service, the Cooperative State Research, Education and Extension Service, Office of Pest Management Policy, Environmental Protection

Agency, commodity groups, and agribusiness to assure that needed data are available, consistent, current, and searchable. The Pest Management Information Decision Support System program is a key component in providing USDA, EPA, Congress, and the Office of Pest Management Policy with finger-tip access to new and rapidly changing data bases, making research information accessible to assist the regulatory decision making process.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation.

Response. The Pest Management Information Decision Support System underwent two reviews in 1997. The first was a formal review of the entire program in June, 1997 which recommended: 1) focusing the system on the needs of the Pest Management Alternatives Program, 2) the timely delivery of a software product to USDA, and 3) the development of a plan to sustain the system in a user-friendly, widely available formal. A second review which was conducted in November, 1997, focused strictly on the Pest Management Alternatives Program Work-Bench surfaced the following recommendations: 1) to expand the WorkBench linkages to additional relevant databases, 2) investigate the potential of placing the system on the World Wide Web for greater access and utility, 3) market the system to potential users, and 4) link to high quality databases to support and enhance data integrity of the WorkBench. In August, 1998 a progress review was conducted to evaluate the engineered software product and it was determined that a web accessible multiple database search capability was essential for the system. A concept review conducted in September, 1998, and at this review the functionality of a web-based decision support system was first demonstrated.

FARM AND RURAL FINANCE, ILLINOIS AND ARKANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the farm and rural business finance program.

Response. The Center for Farm and Rural Business Finance at the University of Illinois and the University of Arkansas is supported, in part, by the federal funding for this project. The Center conducts a program of research and information on the financing of farms and rural businesses in the United States. The plan of work focuses on the financial management performance of farm and rural businesses, evaluation of financial markets and credit institutions serving rural America, and the impacts of public policies and regulations on the structure and performance of rural financial markets. During the past year, 17 projects have been conducted through the Center. They address financial issues facing farmers and rural businesses that range from financial risks faced by hog producers to farmland turnover rates to lending trends among large commercial banks. Professional staff at the two institutions are engaged in both joint and separate projects.

Mr. Skeen. What is the national, regional, or local need for this research?

Response. The current financial stress in various regions and sectors of the farm economy, the changing structure within the agricultural sector, and financial implications of risk management strategies and technical change have created a national need for this research. The level of financial stress varies across commodities and with regional variation in yields and product mix. Analyses are needed to assess the financial impacts of agricultural policies and programs that provide various dimensions of the "safety net." Changes to the federal income tax, capital gains tax and estate tax provisions can have significant impacts on owners of agricultural assets.

Research is needed to identify impacts on individuals and those that may affect local institutions.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal is to assist farmers, ranchers and rural businesses with research-based information on financial management as they deal with increasingly complex financial decisions. During this past year the program has conducted projects on the relationship between financial risk and farm size, financial aspects of various production technologies and management practices of small and medium-sized pork producers, the effect of technical change on rural commercial bank delivery systems, and regulatory costs in rural lending. Projects are being completed on the post-acquisition performance of banks resulting from recent mergers, levels and trends in small farm and small business lending across different types of commercial banks, and the measurement and classification of the financial performance of agribusiness firms. Additional projects have developed a model of working capital management applicable to a wide variety of selected agribusiness firms and have identified primary risks associated with lending to integrated farm production units. Other projects are measuring the longer term impacts of changes in the Federal tax laws on the financial performance of Illinois farms, evaluating the financial characteristics of rural banks and assessing their competitiveness in rural financial markets, and identifying the financial characteristics of high performing agricultural banks. A project at the University of Arkansas has analyzed the effects of financing in accelerating the cattle cycle.

Mr. Skeen. How long has the work been underway, and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work has been underway since 1992. Appropriations were $125,000 in fiscal year 1992, $125,000 in fiscal year 1993, $118,000 in fiscal year 1994, $106,000 per year in fiscal year 1995 through fiscal year 1997, $87,000 per year in fiscal year 1998, fiscal year 1999 and fiscal year 2000. Appropriations through fiscal year 2000 total $947,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal sources and funds provided for this program in fiscal year 1992 totaled $259,427 with $58,427 in State appropriations, $189,000 from industry and $12,000 from miscellaneous sources. In fiscal year 1993, the total was $287,890 with $94,588 in State appropriations, $133,000 from industry and $25,000 from miscellaneous sources. In fiscal year 1994, the total was $391,000 with $221,000 coming from State appropriations, $45,000 from industry and $125,000 from the National Research Initiative competitive grants programs. In fiscal year 1995 the total was $185,000 where $46,000 came from State appropriations, $62,500 from industry and $76,500 from miscellaneous sources. In fiscal year 1996, the total was $344,000 where $294,000 was appropriated from State sources and $50,000 from private sources. In fiscal year 1997, $125,000 was appropriated from State sources, $103,000 was received through a National Research Initiative grant, and $130,876 was received from the Council on Food and Agricultural Research. In fiscal year 1998, $176,250 was received from a Fund for Rural America grant, $65,000 from a CSREES Special Research Grant, and $20,000 from miscellaneous sources. In fiscal year 1999, $133,500 was received from the Illinois Agricultural Experiment Station in the form of faculty-researcher salaries; the Arkansas Agricultural Experiment Station was providing $49,500

in similar support; and the Illinois Farm Development Authority provided $125,000. Non-federal support for fiscal year 2000 has not been identified.

Mr. Skeen. Where is the work being carried out?

Response. Researchers and professional staff conducting this program are located at the University of Illinois and the University of Arkansas.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives of the program, as amended with additional funding and new termination dates now extend to fiscal year 2000. Initial objectives have been met; however changing financial conditions in the farm and rural business environment continue to add new dimensions to these original objectives. Anticipated completion dates of these amended objectives extend through fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project. Provide a summary of the latest evaluation conducted.

Response. In addition to the scientific and peer reviews conducted at the institutions, the program is evaluated periodically within the agency through direct contact with the Director of the Center and the project leaders, as reports are received, and annually when proposals are submitted. The latest evaluation occurred in March, 1999 when the most recent comprehensive report was received. Agency criteria are used to evaluate the program in terms of whether objectives are relevant and consistent, appropriate methods are being used, time lines are being met to a reasonable extent, and results are being disseminated through reports and scientific publications. The major objectives of the program are being met and results from specific projects are being shared through regional research committees and other outlets as they evolve. The latest evaluation shows 18 separate projects underway with many nearing completion. Results are applicable to issues within the rural finance community. A National Symposium for Agricultural Finance Executives provides a valuable service and visibility for the Center. The program has produced an impressive number of publications. Articles have been published in leading U.S. agricultural and finance journals and in international outlets.

FEED BARLEY FOR RANGELAND CATTLE, MONTANA

Mr. Skeen. Please provide a description of the research that has been funded under the Feed Barley for Rangeland Cattle grant.

Response. This project supports research on the nutritional value of barley cultivars as feed for beef cattle. This research will assist the breeding and selection of superior barley types that can be more competitive with other feed grains and improve farmer income from barley crops grown in rotational systems in the Northern Great Plains. The project was subjected to a merit review.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Barley is grown extensively as a feed grain in the United States. Based both upon chemical analysis and the experience of some cattle

feeders, the principal investigator believes barley should have a feed value on a par with corn or wheat. However, currently barley is listed as inferior to both corn and wheat in feed hand books and is, therefore, discounted in the feed market. Comprehensive feeding studies of various barley types will be conducted to document the value as a feed grain for beef cattle.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to determine the true relative feeding value of barley for feeder cattle, and thereby improve the economic return to barley producers.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1996 with an appropriation of $250,000; for fiscal year 1997, $500,000; for fiscal years 1998 and 1999, $600,000 each year; and for fiscal year 2000, $637,500. The total appropriation is $2,587,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds for this project were $160,000 in 1996, $174,500 in 1997, and $168,000 in 1998. No information is available for 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Montana State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Completion of the original objectives is anticipated in fiscal year 2001. Integrating of findings into management systems is expected by fiscal year 2005 with outreach and information dissemination completed by fiscal year 2010.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project is evaluated annually. It undergoes a scientific merit review by two Department Heads and three peer faculty members. It is reviewed again by a CSREES National Program Leader upon submission to the agency.

FLORICULTURE, HAWAII

Mr Skeen. Please provide a description of the research that has been funded under the floriculture program grant.

Response. The research carried out with these funds involves wholesale and retail US and Japan market research, development of new varieties for aesthetic values and pest resistance, and pest management strategies to meet quarantine needs and consumer expectations.

Mr. Skeen. According to the research proposal, or the principal

researcher, what is the national, regional or local need for this research?

Response. The researcher believes the tropical cut flower and foliage industry in Hawaii, which includes anthurium, orchids, flowering gingers, bird of paradise, heliconia, protea, and cut foliage is worth over $50 million primarily in out-of-state sales. Development of disease resistant cultivars and quarantine pest management strategies that reduce pesticide usage are high priority issues at the national level.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research was to develop superior Hawaii anthuriums, orchids, protea, and exotic tropical flower varieties with disease resistance, particularly to anthurium blight which devastated the Hawaii anthurium industry through the mid-1980's and reduced Hawaii's market share. Additionally, research focused on development of post-harvest handling practices and quarantine pest control. To date, a new anthurium cultivar has been patented and released. Additional blight resistant cultivars are being propagated and tested by the anthurium industry. Disease resistant protea germplasm has been obtained from South Africa and is being used in the protea breeding program. A post-harvest hot water dip treatment has been developed and is being used commercially on tolerant cut-flower species to meet quarantine requirements.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $300,000; fiscal years 1990-1993, $296,000 per year; fiscal year 1994, $278,000; and fiscal years 1995-2000 $250,000 each year. A total of $3,262,000 has been appropriated since 1989.

Mr. Skeen. What is the source and amount of nonfederal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: State appropriations of $87,937 in 1995, approximately $77,000 in 1996, $56,680 in 1997, and $62,600 in 1998 for a total of $207,217 since 1995.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by the University of Hawaii at Manoa and Hilo.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives in the original project were to maintain Hawaii floricultural industry competitive. This objective continues to be the principal direction for the projects. Because the industry and the markets are changing pests are becoming either resistant or newer strains. And quarantines are changing with technology the objective remains valid.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The individual projects funded under this Special Research Grant are evaluated through merit review to ensure that good science is being used. This evaluation is the major tool used to award funds to the projects.

FOOD AND AGRICULTURE POLICY INSTITUTE, IOWA AND MISSOURI

Mr. Skeen. Please provide a description of the research that has been done at the food and agriculture policy institute program.

Response. The Food and Agriculture Policy Research Institute --FAPRI-- was established by Iowa State University and the University of Missouri, Columbia, in 1984. The purpose of the institute is to conduct comprehensive analysis and disseminate results about the economic impacts of U.S. food, farm, and trade policies to agricultural producers, agribusinesses, and public policymakers. Iowa State conducts research on the economic interrelationships within and between domestic and foreign food and agricultural markets from the farm gate to market destinations; develops and maintains databases and analytical support systems to facilitate the analysis of agricultural and trade policy issues; and evaluates the impacts of U.S. and foreign commodity supply, demand, and public policy programs on agricultural trade. The University of Missouri maintains models of the domestic agricultural economy and directs its efforts primarily to the analysis of domestic policy issues. The two universities maintain linkages with a number of other universities who provide data and analytical support to the system.

The universities maintain a comprehensive analytical modeling system of the U.S. and international food and agricultural sectors to evaluate near- and long-term economic implications of alternative farm policies for the basic commodities. Each year, and more often if conditions require, the system is used to provide economic information on potential impacts out to 10 years in the future of farm policies on farm prices, income, output, government program costs and means to enhance the management of farm programs at the national level.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local need for this research?

Response. The Nation's agricultural sector and its components are subject to numerous Federal policies and programs. FAPRI is the only publicly supported, non-federal organization with the analytical capability to assess and evaluate the numerous public policies and programs affecting the agricultural sector and report results to a broad constituency including farmers, agribusinesses, and Federal and State policymakers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to develop the analytical capability to assess and evaluate U.S. farm policies on the U.S. agricultural sector and disseminate this information to farmers, farm and other agricultural organizations and public policymakers. The mission has been expanded to include assessment of trade and environmental policy impacts and their interaction with the agricultural sector at national, regional, and farm levels. The models in place are also used to assess fiscal and monetary policy implications and impacts of new technologies such as biotechnological innovations on the agricultural sector.

Both institutions maintain large econometric models and data sets which

are regularly updated to analyze farm and trade policy alternatives and the impacts of various programs on the several sub sectors of the agricultural economy. This update was especially valuable for conducting analysis to assess policy options for the 1996 farm bill. During the past year, the FAPRI completed 35-40 studies addressing policy issues such as assessments of the 1996 Farm Bill, alternative ethanol programs, USDA's proposed milk market order reform, U.S.-Canada agricultural trade, the importance of fast track to U.S. agriculture economic recession in the Middle East and the economic meltdown in Russia. Numerous studies were completed addressing improvements made to the empirical modeling system to improve domestic and international policy capabilities. The FAPRI staff has made numerous public appearances throughout the U.S. to agricultural groups and Congressional committees and Executive branch groups addressing policy issues.

Mr. Skeen. How long has the work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal years 1984-1985, $450,000 per year; fiscal years 1986-1987, $357,000 per year; fiscal year 1988, $425,000; fiscal year 1989, $463,000; fiscal year 1990, $714,000; fiscal years 1991-1993, $750,000 per year; fiscal year 1994, $705,000; fiscal years 1995-1996, $850,000 each year, and fiscal year 1997-2000, $800,000. The total amount appropriated is $11,171.000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $260,355 State appropriations, $113,565 industry, and $37,913 miscellaneous for a total of $411,833 in 1991; $321,074 State appropriations, $51,500 industry, and $35,100 miscellaneous for a total of $407,674 in 1992; $234,796 State appropriations and $70,378 industry for a total of $305,174 in 1993; $78,286 State appropriations, $43,925 industry, and $29,750 miscellaneous in 1994 for a total of $151,961 in 1994; $80,155 State appropriations, $37,128 industry, and $42,236 miscellaneous for a total of $159,519 for 1995; $124,123 in State appropriations with no other funding for 1996; $79,000 in State appropriations, $50,000 industry and $25,000 miscellaneous for a total of $154,000 in 1997; and $88,800 State appropriations, $75,200 industry, and $34,687 miscellaneous for a total of $198,687 in 1998.

Mr. Skeen. Where is this work being carried out?

Response. The program is carried out at the Center for Agriculture and Rural Development, Iowa State University and the Center for National Food and Agricultural Policy, University of Missouri.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. While individual projects show progress towards achieving the goal, this is a continuing program of research and analysis for the purpose of assessing farm and related policy actions and proposed actions likely to affect the agricultural sector and its components.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The annual proposal is carefully reviewed for adherence to stated objectives and progress before the special research grant is awarded. It is also peer reviewed prior to its submission. No formal evaluation of this program has been conducted.

FOOD IRRADIATION, IOWA

Mr. Skeen. Please provide a description of the research that has been funded under the food irradiation grant.

Response. Since the Linear Accelerator Facility was placed in operation in March 1993, studies on the effect of irradiation on shelf-life extension, safety and quality of ground beef, beef steaks, ham, pork chops from loins, chicken breasts, and turkey have been conducted. Studies combining irradiation with high hydrostatic pressure and cooking, using whole chicken breasts, turkey and ham, have been conducted to determine the combination of these treatments that will yield a shelf-stable product while maintaining high eating quality. Several studies were conducted to determine whether consumers can detect a difference between irradiated and non-irradiated ground beef patties. Experiments were also conducted to investigate consumer acceptance of pork products irradiated to prevent trichinosis. Test markets of irradiated chicken breasts were conducted to determine consumers' willingness to pay for irradiated products. Studies on the effect of packaging materials on quality of irradiated meat have been completed. Quality changes in ready-to-eat meat and poultry products irradiated to control *Listeria* are under investigation. The fiscal year 2000 funds are supporting research from May 1, 2000 through June 30, 2001.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes consumers' attention and concern about the safety of fresh meat and poultry has increased with recent outbreaks of foodborne illness from *E. coli* 0157:H7 and *Listeria monocytogenes*. The meat industry has also expressed interest regarding the quality of irradiated products, and how this process can be used to yield high quality fresh meats and ready-to-eat products that are free of pathogens. The recent massive recall of over 50 million pounds of frankfurters and luncheon meats due to illness caused by *Listeria monocytogenes* contamination has resulted in huge economic losses. Additionally, researchers from eight other research institutes have used the irradiation facility for research projects. Thus, the principal researcher believes this research to be of national, regional and local need.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The original goal of the research was to generate knowledge necessary to develop a research and technology transfer program leading to commercial use of irradiation of foods, whereby consumers would be provided with food products with enhanced safety. The effectiveness of irradiation, using an electron beam accelerator, in destroying known pathogenic bacteria in pork and beef has been determined. Mathematical models have been developed to predict the growth of bacteria in low-dose irradiated ground pork. Demonstration of irradiation technology has been presented to some commercial firms, and plans are being developed for some large scale test markets.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 when $100,000 was appropriated for this project. The appropriations for fiscal years 1992 and 1993 were $237,000 per year; fiscal year 1994, $223,000; fiscal years 1995-1997, $201,000 each year; and fiscal years 1998-2000, $200,000 per year. A total of $2,000,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The project received $1,037,270 in State of Iowa funds- $1 million of which was for capital construction- in fiscal year 1991; $37,942 in state funds and $67,800 in industry grants in fiscal year 1992; $68,897 in state funds, $78,300 in industry grants and $9,666 in user fees in fiscal year 1993; $70,652 in state funds, $35,420 in industry grants and $47,788 in user fees in fiscal year 1994; $72,772 in state funds, $100,000 in industry grants and $55,211 in user fees in fiscal year 1995; $81,540 in state funds, $115,300 in industry grants and $50,963 in user fees in fiscal year 1996; and $77,963 in state funds, $253,450 in industry grants and $46,550 in user fees in fiscal year 1997; and $100,200 in state funds, $205,900 in industry grants and $36,200 in user fees in fiscal year 1998; and $125,000 in state funds, $213,800 in industry grants and $34,900 in user fees in fiscal year 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Iowa State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The principal investigator anticipates that the project 's original objectives will be met within a few years after the USDA final rules are issued for ready-to-eat meat and poultry products.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A review of the proposal supporting the fiscal year 1999 appropriation was conducted on February 24, 1999. Previous studies funded under this project have provided useful information toward understanding how irradiation can be useful in eliminating or reducing foodborne pathogens in meat products. It is anticipated that the proposed research will continue to further the understanding of how irradiation can be used to improve shelf-life and enhance safety of meats and meat products.

FOOD MARKETING POLICY CENTER, CONNECTICUT

Mr. Skeen. Please provide a description of the research done under the Food Marketing Policy Center grant.

Response. The Food Marketing Policy Center was established in 1988 at the University of Connecticut at Storrs. The Center seeks to improve the performance of the food production and marketing system by conducting research on food and agricultural marketing and related policy questions. The Center is primarily an economic research organization, but it conducts

interdisciplinary research as appropriate and it communicates results to the public. Key users include farm and consumer organizations, agricultural business firms, public agencies, state legislatures, and the U.S. Congress. The research proposal was subject to an administrative review and a peer review by the university prior to submission to CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The research addresses an ongoing national need to monitor the performance of the U.S. food system and to recommend policies that improve performance for the benefit farmers, merchants, processors, and consumers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The ongoing research goal is to identify marketing problems and assess alternatives that improve economic performance of the U.S. agricultural and food marketing sector. The Center serves as a core research group for Regional Research Project NE-165, Private Strategies, Public Policies, and Food System Performance. The research agenda includes industrial organization, strategic marketing, economics of food safety, cooperatives, and public policy including antitrust and regulation.

The Center is a prolific provider of high quality theoretical and empirical work, and makes significant scientific, management, and policy contributions. The Center has prepared about 50 working papers, 40 policy research reports, 20 policy issue papers, 8 books and numerous chapters, a number of MS and PhD theses, and has distributed scientifically important research articles to researchers, industry, federal and state legislators, and decision makers.

This grant annually supports ten to fifteen research projects in two problem areas: impacts of changes in strategies, technologies, consumer behavior and policies on the economic performance of the food system, and impacts of private and public strategies on improvements in food safety and quality. Projects include competitive strategy analysis of cooperatives and investor-owned firms; firm dominance in food manufacturing; advertising; mergers, product relatedness and performance outcomes; effects of market structure and concentration on promotional activity; testing theories of oligopoly conduct; relationships between market structure, firm position and price levels; strategic responses to food safety and nutritional regulation; and trade agreement effects on food quality and trade.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1988, $150,000; fiscal year 1989, $285,000; fiscal year 1990, $373,000; fiscal years 1991-1993, $393,000 per year; fiscal year 1994, $369,000; fiscal years 1995-1998, $332,000 each year; and fiscal years 1999-2000, $400,000 a year. A total of $4,484,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are State appropriations as follows: $234,259 in fiscal year 1991; $231,741 in fiscal year 1992; $201,288 in fiscal year 1993; $234,557 in fiscal year 1994;

* * *

$219,380 in fiscal year 1995; $134,399 in fiscal year 1996; $135,490 in fiscal year 1997; $164,772 in fiscal year 1998; and $163,895 in fiscal year 1999.

Mr. Skeen. Where is the work being carried out?

Response. The research is being carried out at the University of Connecticut and the University of Massachusetts.

Mr. Skeen. What was the anticipated completion date for the original objectives if the projects? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1987 was for 24 months. According to the principal researcher, the objective of conducting policy-oriented research on food manufacturing and distribution industries to assist state and Federal policy makers in improving the performance of the food system is still an ongoing public concern, given increasing levels of concentration in food processing. The current phase will be completed in 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in April 1999, as it evaluated the 1999 project proposal, and determined that the "PI and associated researchers are nationally and internationally recognized and are clearly competent to execute this project. Funded research will take place at the Center . . . and in collaboration with researchers at the London Business School, University of Nebraska, Rutgers University, Montana State University, and USDA." The proposal also was subjected to peer review by experts with scientific knowledge and technical expertise.

FOOD PROCESSING CENTER, NEBRASKA

Mr. Skeen. Please provide a description of the research that has been funded under the food processing center grant.

Response. The University of Nebraska Food Processing Center has been conducting short-term, highly applied research projects to assist small and mid-sized food processing companies and entrepreneurs to develop or improve processes and products and to develop new food processing enterprises. Projects were selected based on the estimated economic impact of the technical assistance or the criticality of the technical assistance to the future of the firm or venture. Priorities were placed on projects relating to the safety of the food product or process and to the fulfillment of regulatory mandates such as nutrition labeling, use of approved and effective ingredients, and adherence to regulations imposed by foreign governments. In addition, several research projects were conducted to improve or assess the quality, extend the shelf-life, or assess or improve the processing efficiency of specialty food products which impacted several processors or used alternative agricultural products.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the primary impact of this project will be statewide. Small and mid-sized food processing companies and

entrepreneurs have limited technological capabilities for addressing issues related to product development, process development, product and process evaluation, food safety, quality assurance, and regulatory mandates. The short-term research and technology transfer projects conducted as part of this overall project will aid these companies in appropriately addressing these oftentimes complicated issues.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research, as stated previously, is to assist small and mid-sized food processing companies and entrepreneurs to develop or improve processes and products and to develop new food processing enterprises. Technological evaluations were conducted for 89 individuals or companies interested in developing new food processing businesses. These evaluations included formulations, processes, processing equipment, packaging, shelf-life, sensory, nutritional attributes, microbiological quality, regulatory considerations, and other factors. Additionally, microbiological analyses, shelf-life assessments, sanitation audits, and nutritional analyses were conducted for numerous Nebraska food companies.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1992. The appropriations were $50,000 per year for fiscal years 1992-1993 ; $47,000 for fiscal year 1994; and $42,000 for fiscal years 1995-2000 each year. A total of $399,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The Food Processing Center received $402,389 in State funds and $1,993,914 in food industry grants and miscellaneous sources from 1992 through 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of Nebraska.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. Because this project supports ongoing technical assistance to clients, the objectives are ongoing.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. A review of the proposal was conducted on March 31,1999. Progress under previous grants for this project appears to be satisfactory, with numerous examples of assistance cited and summaries of short-term projects provided by the principal investigator.

FOOD QUALITY, ALASKA

Mr. Skeen. Please provide a description of the research that has been funded under the Food Quality, Alaska grant.

Response. Research will be aimed at establishing the Salmon Quality Implementation Project. The project has two parts. The first part is the evaluation, design, and implementation of a voluntary quality seal that can be attached to salmon that meet the existing standards for premium and number one grade. The second part is a series of workshops and training sessions on salmon quality handling and maintenance for workers at all levels of the industry, from harvesting to retail.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The seafood industry is Alaska's largest employer and main source of revenue in many communities along its 38,000 miles of coastline. The salmon fishery is second only to groundfish in providing the most value in the industry. It is the mainstay of many traditional, family-owned businesses. The salmon industry is regional, involving thousands of fishermen and processing workers from Washington State, Oregon, California and throughout the nation that come to Alaska to participate in the fishery. In recent years, the Alaska salmon industry has suffered economically from increased competition from international salmon farmers, mainly in Norway and Chile. They have made great inroads in many traditional markets, surpassed Alaska in salmon production, and now set the product standard in the marketplace. One key for American businesses to recapture and strengthen their salmon markets is to guarantee and promote the quality of wild Alaska salmon. This project will provide the industry with the research and information needed to accomplish this.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The original goal of this research was to ensure a consistent and predictable level of handling and quality for Alaska seafood. In doing so, the project will help Alaska seafood processors strengthen or maintain their place in domestic and international markets. Because this is a new grant, no progress has yet been reported.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999 and the appropriation for fiscal years 1999 and 2000 $350,000 each for a total of $700,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The State of Alaska, the Alaska Seafood Marketing Institute and the industry will contribute considerable personnel hours to perform the work described in the application. The state will contribute the time of several staff people to research and help establish the voluntary quality seal program. Nine hours a week of staff time through the end of the fiscal year (31 weeks) would account for approximately $10,000. The Alaska Seafood Marketing Institute will have a staff person set up training workshops throughout Alaska.

Mr. Skeen. Where is this work being carried out?

Response. The work will be administered at the University of Alaska Fairbanks. Field work will be carried out in numerous Alaska fishing communities.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The anticipated completion date for the quality and handling training portion of the project is July 1, 2000. The anticipated completion date for the voluntary quality seal portion of the project is December 31, 2000. The project managers will able to report at that time on their success at meeting project objectives.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The proposal received in support of the fiscal year 1999 appropriation was reviewed for merit by a CSREES specialist on August 27, 1999.

FOOD SAFETY, ALABAMA

Mr. Skeen. Please provide a description of the research that has been funded under the Food Safety, Alabama grant.

Response. Auburn Research Centers Food Safety Program is developing a method of food inspection that involves the placement of a sensor chip on food items. The goal is for these chips to automatically inventory and assess the safety at any point from source to consumption of appropriate fresh food products sold in the U.S.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Most food-borne illness can be attributed to bacteria. The sensor chips developed at Auburn University will target detection of the bacteria that causes most of these illnesses. This technology could result in financial savings nationally, regionally, and locally through the prevention of food-borne illness and its related costs. Up to 33 million Americans become ill each year from food borne disease. Estimates indicate that as many as 9,000 of these individuals will die with another one million suffering permanent disabilities. The USDA estimates that foodborne illness costs the US economy $14.2 billion in lost productivity annually. This project will improve the safety of our food supply chain leading to an improved quality of life for every citizen and resident of the United States. In addition to these costs to the public and the nation, the costs to industry of settling civil litigation due to foodborne disease can be immense. The 1993 Jack-in-the-Box hamburger incident, which infected 433 individuals, resulted in lawsuit settlements of $126 million dollars. This research when implemented should greatly reduce the incidence of foodborne illness.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this project is to reduce the incidence of food-borne illness through the use of a sensor chip that will assess the safety of food items as they move through the food chain. The research will

be conducted through June 2000 so the results will be available after that time. Already to date, the researchers have demonstrated a new method for the detection of *Salmonella* bacteria that has the potential to greatly reduce detection times. Current industrial methods require that a sample of suspect food be taken to the lab where tests require a minimum of 6 to 48 hours to determine a food is safe to eat. The new technology can identify harmful levels of *Salmonella* bacteria in a few minutes and will be packaged as a portable hand-held unit that may be used on the food production line. Additionally, Auburn University has demonstrated a working stamp size radio frequency identification sensor tag that can be used to automatically inventory and trace food within seconds. This tag stores information from farm to its final destination and can be interrogated to rapidly provide information to identify the source of a contamination or food problem should it be detected at a latter date downstream.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in June, 1999. The appropriation for fiscal year 1999 was $300,000 and for fiscal year 2000 is $446,250. A total of $746,250 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. Non-federal state funds of $577,350 have been allocated to additionally sponsor the research in fiscal year 2000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Auburn University, through the Auburn Research Center for Detection and Food Safety.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The anticipated completion date for the original objectives will be one year following the date of the award. The award date was June 15, 1999. Already the project has achieved over 50 percent of the first year objectives.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project has been underway for less than 6 months. Normally evaluations are conducted on an annual basis which would make the next evaluation due after June 2000.

FOOD SYSTEMS RESEARCH GROUP, WISCONSIN

Mr. Skeen. Please provide a description of the research that has been done under the Food Systems Research Group program.

Response. The Group conducts research on contemporary issues affecting the organization and competitiveness of the U.S. food system in domestic and international markets. The issues include new technologies, market structure, firm behavior, and government policies and programs. Studies have been completed on pricing of cheddar cheese, fed cattle and hogs; changes in

private label product markets; causes of structural change in the flour milling, soybean oil milling, wet corn milling, cottonseed milling, beef packing, and broiler processing industries; competition in U.S. food markets; and the relationship between U.S. food market structure and the industry's performance in global markets. The research proposal was subject to an administrative review and a peer review by the university prior to submission to CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes that the U.S. food system is changing rapidly in response to a large number of global economic, social, and technological changes. Research is needed to determine the effects of these changes on the system's organization and performance, and to ascertain needed adjustments in public policies based upon sound research. There is a national need to assess and evaluate the organization and performance of the Nation's food industry to ensure that it continues to satisfy performance expectations of farmers and consumers and adheres to acceptable standards of conduct. In spite of the growing concentration in food production-processing and increasing public policy questions concerning the performance of this industry, few organizations like the Food Systems Research Group are providing research needed for public and private decision making.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. The original goal was to assess and evaluate the organization and performance of the U.S. food industry and provide recommendations for improvements. Recent research developed models to estimate allocative efficiency in broiler, beef and pork subsectors; allocative inefficiency appears in all three because participants do not adequately anticipate dynamic market changes; vertical integration in broilers has greatly improved production efficiency but not allocative efficiency. The strategic behavior of Wisconsin agribusiness firms was documented in three case studies: one firm operates in the mature artificial breeding industry; the other two deal with relatively high input costs for cheese production. Other work continues to focus on the impact of "tough competition" on industry performance. In 1996, the project published its analysis showing manipulation of prices on the National Cheese Exchange by Kraft General Foods. Subsequently, USDA discontinued using Exchange prices in calculating basic formula milk prices, the Exchange closed, and the Chicago Mercantile Exchange opened a new cheese market. In December 1998, the University was able to publish additional materials previously held back by legal proceedings.

The project has completed numerous studies on economic structure and performance issues of the U.S. food manufacturing and distribution system. Basic research is conducted on market theories; effects of mergers, new technologies, and firm conduct on industry structure and organization; factors affecting industry prices, profits, efficiency and progressiveness; and impact of public policies and regulations on food system organization and performance.

Mr. Skeen. How long has this work been underway, and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal years 1976-1981, $150,000 per year; fiscal years 1982-1985, $156,000 per year; fiscal years 1986-1989, $148,000 per year; fiscal year 1990,

$219,000; fiscal years 1991-1993, $261,000 per year; fiscal year 1994, $245,000; fiscal years 1995-1998, $221,000 per year; fiscal year 1999, $225,000; and fiscal year 2000, $425,000. A total of $4,897,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: State appropriations of $120,304 in 1991; $119,448 in 1992; $85,188 in 1993; $96,838 in 1994; $59,435 in 1995; $50,636 in 1966; $56,421 in 1997; $64,004 in 1998; and $75,115 in 1999.

Mr. Skeen. Where is the work being carried out?

Response. The grant supports research at the University of Wisconsin, Madison.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1976 was for a period of 36 months. The current phase of the program will be completed in fiscal year 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in July 1999, as it evaluated the 1999 project proposal, and concluded: "The Food Systems Research Group at the University of Wisconsin does excellent research on structure, conduct and performance of selected segments of the food industry and publishes in respected journals. Researchers have won many professional awards. Much of the work provides empirical tests of competing theories. In spite of the growing concentration in food production-processing and increasing public policy questions concerning the performance of this industry, few organizations like the University of Wisconsin are providing research needed for public and private decision making."

FORAGES FOR ADVANCED LIVESTOCK PRODUCTION, KENTUCKY

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. The Cooperative State Research, Education and Extension Service has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to provide improved forages/livestock management systems for Kentucky and adjacent areas.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to improve the economics

of livestock production through the use of advanced production systems.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $212,500.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new project and no non-federal funds have been provided to date.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the University of Kentucky Research Station.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is fiscal year 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency has not yet received the project proposal. It will be reviewed and evaluated prior to awarding fiscal year 2000 appropriations.

FORESTRY RESEARCH, ARKANSAS

Mr. Skeen. Please provide a description of the research that has been done under the Forestry Research grant.

Response. The Arkansas Forest Resources Center offers programs of research, education, and outreach to the landowners of Arkansas and the surrounding region. This has been accomplished through continuing education events for landowners, the development of a series of distance-learning tutorials, and the funding of 20 assistantships for the first two classes of graduate students in the new forest resources master's program. A partial list of workshops includes: Uneven-aged Silviculture of Loblolly and Shortleaf Pine Forest Types, Environmental Law & Policy, Timber Income Tax Update, Thinning Methods and Operations, Introduction to Arc View 3.0, Estate Planning, Forest Finance Applications: Basic Tools for Daily Practice, and Opportunities in Forest Regeneration. The educational thrust has combined Center and private dollars to establish one of only three of the country's Arc View Learning Centers for natural resources. To better provide the highly educated professionals needed in the natural resources professions, educational tutorials are being developed in dendrology-tree ID, plant morphology, silvics--that aid in the (1) transfer of students in community colleges to institutions with forest resources offerings, and (2) forest resources education of non-majors at institutions without forest resources faculty. Furthermore, the University of Arkansas activated a new Master of Science program in the Fall 1998.

Research projects address issues of species diversity, richness, redundance, and the resilience of disturbed and undisturbed hardwood stands of the Mississippi River floodplain. Furthermore, research has indicated that neotropical migratory birds are indicators of ecosystem health. Factors influencing their breeding range, include habitat destruction/ alteration and forest fragmentation. Thus, issues of re-establishment and structure of hardwood stands are important for timber, non-timber values, and the quality of life enjoyed regionally, nationally, and internationally. Also, other projects are contributing to the development of (1) a biological control agent for the southern pine beetle, (2) alternative forest crops for the economically-depressed Delta region, and (3) technologies for enhanced fiber and wood production from nonindustrial and industrial lands. Newer projects include an important regional social science study of the resource ethical values held by people of the southern United States and a comprehensive study for forest growth and yield.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, and local need for this research?

Response. With the reduced levels of production of wood products from the Northwest, southern forests are increasingly having to produce a major portion of wood products for the United States. This increased demand and production make it critical that the forestry community understand the possible environmental effects of forestry practice. Social implications of the conflicts between forest production and environmental quality will become more and more important. Collectively, the projects address the sustainable management of southern forests.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research is to develop alternative forest management strategies for achieving multi-resource objectives; i.e., production of timber, wildlife, recreation and other values of the forest on private industrial and nonindustrial forest lands and public lands. Significant progress has been made in several areas. Some examples include: developing intensive fiber farming systems as alternatives to soybeans for Mississippi Delta farmers, taking the first step toward biological control of the southern pine beetle by discovering the nutrient needs of predators of the beetle so predators can be grown and studied in artificial cultures. The first survey of nonindustrial landowners in Arkansas for 15 years has been conducted. The survey shows that because of the average age of landowners, 60+ years, there will be a massive change in ownership in the next 10-20 years. Landowners continue to not be aware of assistance programs. The survey also indicated a concern about government programs and possible intervention on private land. This information will be useful in understanding future timber supply trends from private holdings and in the design of assistance and educational programs.

Ongoing projects include a broad array of topics, competitively awarded within the Center. These include best management practices, ecological characteristics, effects of different forest management regimes, stream-sided buffer zone effectiveness, effects of winter logging, and secondary processing efficiency.

Mr. Skeen. How long has the work been under-way and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows:

Grant Year	Grant Received
1994	$ 470,000
1995	523,000
1996	523,000
1997	523,000
1998	523,000
1999	523,000
2000	523,000
Total	$3,608,000

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-fiscal funding and its source provided to this grant in 1994 was $411,726 State appropriations and $380,000 industry for a total of $791,726; $491,301 State appropriations and $785,262 industry for a total of $1,276,563 for 1995; a total of $695,204 from State and industry sources for 1996; a total of $1,115,341 from these sources in 1997; and an estimated total of $1,000,000 for 1998. For 1999, the State legislature appropriated approximately $850,000 above the 1998 level.

Mr. Skeen. Where is the work being carried out?

Response. The Arkansas Forest Resources Center is administered from the School of Forest Resources on the campus of the University of Arkansas at Monticello. Individual studies are being conducted at the University of Arkansas at Fayetteville and several locations across the State.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Grants were received 1994-1999 with funds distributed for use over the 3 to 5 years following the activation year. Projects are on schedule; work from 1994 and 1995 funding are nearing completion. Forestry research is long term. Center objectives and selected projects will be continued beyond the life of individual grants using the infrastructure and capacity developed with these Special Research Grants.

Mr. Skeen. When was the last agency evaluation of the project? Provide a summary of the last evaluation conducted.

Response. In 1991, an agency team visited the University and reviewed faculty qualifications, supporting sources, and the feasibility of the proposal. The team exit report indicated the faculty was highly capable, the infrastructure needed strengthening, and the proposal concepts were feasible. Since 1991, there has not been a formal program review. A review planned for the year 2000 has been rescheduled for 2001 because of a change in forest resources leadership at the University.

FRUIT AND VEGETABLE MARKET ANALYSIS, ARIZONA AND MISSOURI

Mr. Skeen. Please provide a description of the research that has been funded under the fruit and vegetable market analysis program.

Response. The purpose is to provide timely knowledge and analysis of the impacts of trade, environmental, monetary, and other public policies and programs upon the Nation's fruit and vegetable industry to farmers, agribusinesses, and policymakers through a program of empirical assessment and evaluation.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional or local need for this research?

Response. The U.S. fruit and vegetable sector is experiencing increased growth from greater domestic and export demand. However, the growth of this sector depends upon its ability to compete domestically and internationally and to conform with the regulatory environment in which it operates. This program of research provides increasingly critical information to farmers and policymakers on the implications and impacts of various policies and programs such as environmental, trade, labor, and food safety. It is the only such program providing analysis of the total U.S. sector.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to develop the analytical capability to assess and evaluate public policies and programs impacting the U.S. fruit and vegetable industry and disseminate the results to policy makers, industry organizations, producers, and other users. Proposals have been submitted that outline long-range plans and specific projects for funding. Models have been developed for 18 major (as measured in production, consumption, and trade) U.S. fruits and vegetables representing 80 percent of the farm value of the U.S. fruit and vegetable industry. Trade models for those commodities with a significant import and/or export sector will also be developed. These models feed in to a larger food and agricultural sector model to support analysis of cross commodity and policy effects.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $329,000; for fiscal years 1995-1998, $296,000 each year; and for fiscal years 1999, $320,000; and for fiscal year 2000, $320,000. A total of $2,153,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funding and its source provided to this grant in 1994 was $50,073 State appropriations and $11,000 industry for a total of

$61,073; $21,876 State appropriations and $36,624 industry for a total of $58,500 for 1995; a total of $62,400 from State and industry sources expected for 1996; and $50,000 each year from these sources in 1997 and 1998.

Mr. Skeen. Where is the work being carried out?

Response. The work is being carried out at Arizona State University and the University of Missouri.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The university researchers anticipate that work will support ongoing, changing projects to look at the impact of various public policy proposals on the U.S. fruit and vegetable industry.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. We have conducted no formal evaluation. However annual proposals are peer reviewed for scientific merit and relevance; also each annual budget proposal is carefully reviewed and work progress is compared with prior year's objectives. Informal discussions with congressional staff indicate that the analyses are extremely useful.

GENERIC COMMODITY PROMOTION, NEW YORK

Mr. Skeen. Please provide a description of the research that has been done under the generic commodity promotion program.

Response. The grant supports, in part, the National Institute on Commodity Promotion Research and Evaluation which provides objective analyses of national and state commodity checkoff programs designed to enhance domestic and export demand for U.S. agricultural products. "Checkoff" programs provide funds from producers to pay for advertizing and promotional programs. The overall project proposal was peer reviewed at the university level; a competitive peer review process is used to select specific research projects.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher states that producers are contributing about $1 billion annually to commodity research and promotion funds designed to expand the domestic and export markets for their products. The number of commodity groups participating and the size of the funds available could continue to grow. The 1996 FAIR Act requires all federally-constituted research and promotion boards to evaluate their programs at least every five years. Accurate evaluations require the development of sophisticated

techniques that differentiate the impact of research and promotion expenditures from several other market influencing factors.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to determine the economic effectiveness of generic promotion programs designed to increase the sales of agricultural commodities in domestic and international markets. Accomplishments over the last five years include: Understanding key economic relationships in the advertising and promotion of milk and dairy products, beef, cotton, and eggs, and the exports of beef, pork, and wheat; developing new methods of estimating the relationships among advertising, promotion, government support programs, and government policy; developing new methods of measuring advertising "wearout;" determining the sensitivity of results using various methods; explaining the effect of socioeconomic and market factors on the impact of advertising; estimating optimal allocation of advertising expenditures by type of media; comparing the relative returns from generic and brand advertising. The Institute has sponsored educational workshops and conferences for promotion board leaders, and for elected and appointed public officials responsible for developing public policy and administering checkoff programs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by the grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $235,000; for fiscal years 1995-1999, $212,000 each year; and for fiscal year 2000, $198,000. A total of $1,493,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal matching funds and sources allocated to this grant by Cornell University are as follows: $97,333 a year in State appropriations for 1994-96; $125,650 for 1997; and $130,430 each for 1998 and 1999. Collaborating institutions performing work under subcontracts also contribute non-federal matching funds.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out at Cornell University in collaboration with eight other land-grant universities.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1994 was for a period of 21 months, however, the need to evaluate the benefits of commodity promotion and research programs is a growing regional and national concern, as producers

take on greater responsibility for marketing their products. An increasing number of promotion and research programs are being evaluated. The current phase of the program will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in February 1999, as it evaluated the 1999 project proposal, and determined that "the project has sound objectives and procedures that are helping private and public decision makers effectively expand markets for US agricultural products leading to a highly competitive agricultural production system and enhanced economic opportunity for Americans. The principal investigator is well recognized for his leadership in this area of research. Research results appear in several peer reviewed professional journals and popular press, and researchers have ongoing dialog with private and public decision makers.

GLOBAL CHANGE

Mr. Skeen. Please provide a description of the research that has been funded under the global change grant.

Response. Radiation from the sun occurs in a spectrum of wavelengths with the majority of wavelengths being beneficial to humans and other living organisms. A small portion of the short wavelength radiation, what is known as the Ultraviolet or UV-B Region of the spectrum, is harmful to many biological organisms. Fortunately, most of the UV-B radiation from the sun is absorbed by ozone located primarily in the stratosphere and does not reach the surface of the earth. The discovery of destruction of the stratospheric ozone layer and development of the ozone hole over polar regions has raised concern about the real potential for increased UV-B irradiance reaching the surface of the earth and the significant negative impact this could have on all biological systems including man, animals, and plants of agricultural importance. There is an urgent need to determine the amount of UV-B radiation reaching the earth's surface and to learn more about the effect of this changing environmental force. The Cooperative State Research, Education and Extension Service, CSREES, is in the process of establishing a network for monitoring surface UV-B radiation which will meet the needs of the science community of the United States, and which will be compatible with similar networks being developed throughout the world. The fiscal year 1999 grant supports work thru September 2000.

This grant is part of a government-wide initiative. The research is closely coordinated with the National Aeronautical and Space Administration, the National Oceanographic and Atmospheric Administration, the Environmental Protection Agency, the Smithsonian, the National Science Foundation, and the Department of the Interior. All these Federal agencies are involved in the U.S. Global Change Research Program Inter-agency UV-Monitoring Network Plan.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes destruction of the stratospheric ozone layer, our shield from the full intensity of solar radiation, continues to increase. This creates a high priority need for information to document not only the levels of UV-B radiation reaching the earth's surface, but the climatology of that radiation. The United States, and the rest of the world, needs to know the strength of the UV-B radiation reaching the earth and the potential impact on all forms of life, especially animal and plant life of agriculturally important species. The principal researcher believes this research to be of national as well as regional and local importance.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The purpose of the USDA UV-B Network is to provide accurate, geographically dispersed data on UV-B radiation reaching the surface of the earth and to detect trends over time in this type of radiation. A primary problem which had to be overcome in order to reach this goal was the development of instrumentation adequate to make the measurements required for the monitoring network. A major advance occurred during 1996 with the availability to the network of a new multi-band instrument which will provide the spectral information needed to support both biological and atmospheric science research and to serve as ground-truth for satellite measurements. These instruments have been deployed and are currently in operation at twenty-six monitoring sites across the United States, including Hawaii. The researchers plan to have additional sites in Alaska, Puerto Rico, Oregon, North Carolina, and Oklahoma, but these plans are on hold due to lack of funding to support their installation and operation.

Two grants to design and build six advanced spectroradiometers have been awarded under the National Research Initiative Competitive Grants Program. These instruments are to be used in a research network to make precise measurements of the total UV-B spectra at selected research sites. The first of these instruments failed to meet spectral performance standards when tested and calibrated by the National Institute of Science and Technology. An alternative design which resulted in a much larger and more difficult instrument to deploy has been developed. The first of the advanced instruments was deployed at Department of Commerce research site at Table Mountain near Boulder, Colorado during the fall of 1998. The second and third were installed at a Department of Energy solar radiation research site in Oklahoma and at an Agricultural Research Service Plant Stress site in Beltsville, Maryland during 1999. Additional funding will be required to support the deployment of additional research instruments.

To gain experience in network operation, broadband instruments along with ancillary instruments were installed at ten sites and have been in operation for the last 64-72 months. These sites are now equipped with a full compliment of instruments including the new multi-band instrument. Sixteen additional sites developed since 1997 are similarly equipped with broadband and the new multi-band UV instrument. Data from each site is transmitted daily to Colorado State University for preliminary analysis, distribution and

archiving. These data are available, within 24 hours of collection, on the Internet via a World Wide Web Site located in the Natural Resources Research Laboratory at Colorado State University. The Department of Agriculture is also a participant in the development of a central calibration facility at Department of Commerce facilities in Boulder, Colorado. The purpose of the central calibration facility is to ensure uniform and acceptable calibration and characterization of all instruments used in interagency UV-B monitoring programs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1992, and the appropriation for fiscal years 1992-1993 was $2,000,000 per year; fiscal year 1994 was $1,175,000; fiscal year 1995 was $1,625,000; fiscal year 1996 was $1,615,000; fiscal year 1997 was $1,657,000; and fiscal years 1998, 1999 and 2000 were $1,000,000 per year. A total of $12,982,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $162,000 state appropriations in 1993; $183,106 state appropriations in 1994; and $285,430 provided by Colorado State University in 1995.

Mr. Skeen. Where is this work being carried out?

Response. Colorado State University is managing the operating network, which when completed will include all regions of the country. At least thirty sites are planned for the climatological network including sites in Hawaii, Alaska and Puerto Rico in order to provide broad geographic coverage. Ten sites have been operational with broad band instruments for up to six years and twenty-six sites are now operational with new generation instruments. The research level network began with the first instrument installed at the Table Mountain, Colorado instrument intercomparison site and the second and third have been installed at the Department of Agriculture Plant Stress Laboratory at Beltsville, Maryland and The Department of Energy Solar Radiation site near Ponca City, Oklahoma as part of the Atmospheric Radiation Measurements field network in 1999.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. As with other weather and climate observations, this network will be an ongoing need for the predictable future. These measurements will provide information on the nature and seriousness of UV-B radiation in the United States and will provide ground truth validation to other predictions of UV-B irradiance. The project has nearly met its first objective of the

establishment of a climatological network to monitor UV-B radiation at the surface of the earth. Years of operation will be required to measure trends in UV-B radiation and to develop models to predict the climatology of UV-B radiation.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency has assigned two technical staff to continuously monitor activities in the global change research program. A team of three experts in UV-B radiation measurement technology reviewed specifications for the development of the advanced spectroradiometers in July, 1996 prior to the procurement of major components of the instrument. A panel of radiation spectra scientists were brought in to review data derived from the new multi-band instruments in December 1996 to advise on the interpretation and analysis of data derived from these instruments. Agency staff is in contact with program management on a weekly basis and has visited the program headquarters six times during the last year. The annual plan of work has been reviewed by three scientists prior to approval by the agency. A review of the UV-B Monitoring Program by a panel of technical experts from outside the Department is planned for 2000.

GLOBAL MARKETING SUPPORT SERVICES, ARKANSAS

Mr. Skeen. Please provide a description of the research that has been done under the global marketing support services program.

Response. The Global Marketing Support Services project provides leadership for a comprehensive program to integrate Arkansas into the global economy. It provides market analyses and other research to identify marketing opportunities, and provides access to essential databases for people interested in conducting their own research. The research effort supports several educational activities, including workshops, educational materials, one-on-one technical assistance that help mostly small and moderate size businesses understand and enter the export market The research proposal received a peer review at the university prior to submission to CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes the emerging importance of global trade to the nation's economy and the reduction of trade barriers world-wide present unprecedented opportunities for cooperative public-private-university research to develop expertise not only in Local markets, but in world markets as well.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to develop a university research and service

organization to support international trade development activities by local area businesses. During the past year, two market analyses were done for Slovakia, and work was initiated for countries in Central and South America. As a result of previous work, a Panamanian business leader visited Arkansas firms in 1999. Two "Export Marketing - Getting Started" workshops were held; six firms received one-on-one assistance and have significantly increased their interest in international marketing. Six factsheets were completed and distributed. An Internet website was used to distribute information, and an Internet international market was developed. The project developed stronger ties with the Small Business Development Council, Arkansas Economic Development Commission and the U.S. and Foreign Commercial Service as partners in educational and technical assistance activities.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $47,000; for fiscal years 1995 through 1997, $92,000 per year; and for fiscal years 1998 through 2000, $127,000 per year. A total of $704,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were $90,000 per year in State appropriations for 1994 through 1996; $51,700 for 1997; $80,000 for 1998; and $83,000 for 1999.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at the University of Arkansas, Fayetteville.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1994 was for a period of 12 months, but the objective of expanding the export capacity of small to medium-sized agribusiness firms will not be met until 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in February 1999, as it evaluated the 1999 proposal, and determined that "the project is helping agribusiness expand markets for US Agricultural products leading to a highly competitive agricultural production system and enhanced economic opportunity for Americans. The principal investigator provides very good leadership for the project and integrates it into the overall research,

education and extension functions of the university to provide relevant and useful assistance to Arkansas firms."

GRAIN SORGHUM, KANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the Grain Sorghum grant.

Response. This project was designed to improve the yield improvement of grain sorghum cultivars by developing early maturing hybrids with a longer grain filling period. The research focuses on identification of sorghum germplasm, which have a longer grain filling period or earlier maturation date. These traits may be used to shift more of the production to grain and less to vegetative growth, thus enabling more efficient use of the limited water supply. These funds are awarded to scientists working on sorghum at Kansas State University.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The focus of this research is toward the non-irrigated lands of Kansas where sorghum can produce a grain crop under conditions that would not be possible with corn and is, therefore, very important in the rotation with wheat. While the research is directed toward Kansas conditions, it would also apply to adjoining states. Germplasm research of national significance could potentially be supported by the competitive grants awarded under the National Research Initiative or the Initiative for Future Agriculture Food and Systems.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to identify germplasm and use it to develop grain sorghum cultivars that mature earlier and produce more grain. Initial studies have identified genetic characteristics controlling grain yield under a range of climatic conditions. Researchers have identified several sorghum lines, which have a grain-filling period as much as one-third longer than U.S. adapted parent lines. Analyses show that variability exists, the trait is genetically controlled, and incorporation into adapted germplasm can be accomplished. Simulation of expected production gains has been initiated.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 1997 and the appropriation for fiscal years 1997 through 2000 was $106,000, for a total of $424,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. In 1998, Kansas State provided support via salaries and associated fringe benefits of $31,852, associated indirect costs of $14,652, and in-kind costs of $45,580, for a total of $92,084 and $95,700 for 1999.

Mr. Skeen. Where is this work being carried out?

Response. These funds are awarded to Kansas State University, which allocates the money to Kansas State University scientists working on sorghum.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives of this project, which began in 1997, are to develop sorghum parental lines with genetically longer grain fill duration and identify changes in management necessary to optimize grain production in these lines. Five years or more are required to accomplish the objectives. The first objective has been completed. The researchers expect to complete the next three original objectives by 2004 and subsequent objectives by 2006. Preliminary results have contributed toward the understanding of factors controlling grain yield and the development of higher yielding sorghum cultivars for Kansas.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project is subjected to the institutional review and approval process, as well as review by an agency scientist. In addition, stakeholder input was obtained through formal and informal methods. The institutional review of the project confirmed that high priority issues of the sorghum industry in Kansas and other sorghum producing states were being addressed.

GRASS SEED CROPPING SYSTEMS FOR SUSTAINABLE AGRICULTURE

Mr. Skeen. Please provide a description of the research that has been funded under the Grass Seed Cropping Systems for Sustainable Agriculture grant.

Response. This program was developed to provide management systems for sustainable grass seed production without field burning of the straw residue following harvest which results in adverse air quality problems. Grass seed yields are often significantly reduced the following season if the residue is not burned.

Funds from this grant are awarded competitively to scientists at Oregon State University, the University of Idaho, and Washington State University engaged in research on grass seed production. Each award has passed a merit review by peer scientist.

Mr. Skeen. According to the research proposal, or the principal

researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that according to information provided by technical committees representing researchers and the grass seed industry, the need for this research is to develop sustainable systems of seed production that do not depend on field burning of straw residue. Much of the grass seed for the United States, including lawn grasses, is produced in the area. Field burning of straw residue creates unacceptable levels of air pollution and yields of some cultivar decline without burning.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal for this project is to develop grass seed production systems that do not depend on field burning of straw residue. To date, joint planning by state experiment station administrators and researchers from the three states with industry input have developed an integrated regional research effort to solve the problem.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $470,000, and for fiscal years 1995-2000, $423,000 each year. A total of $3,008,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal support for this project in fiscal year 1994 was $266,055, $298,052 for fiscal year 1995, $282,053 in 1996 $301,650 in 1997, $310,700 in 1998, and $346,500 in 1999.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted by the three state agricultural experiment stations in Idaho, Oregon and Washington.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Completion of the initial objectives was anticipated to take five years and, were partially completed in 1999. Revised goals leading to application of new management systems have been developed and should be completed in 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The entire project is reviewed annually by a steering committee

for focus and relevance. The combined proposal is reviewed by the agency before funds are awarded.

Considerable progress has been made toward identifying the consequences of phased out field burning of straw residue on grass seed production. Current and future effort are directed toward development of sustainable systems without field burning. This program is subject to annual comprehensive evaluation by a team of peer scientist, industry representatives, and farmers. The results are used to guide research for the next year. Each proposal is subjected to the institution project approval process and reviewed by the agency National Program Leader.

HUMAN NUTRITION, IOWA

Mr. Skeen. Please provide a description of the work that has been funded under the Human Nutrition, Iowa grant.

Response. This research aims to develop animal and plant foods with nutritionally optimal fat content and to improve utilization of foods containing non-nutrient health protectants, components that may reduce health risks. The research includes food production and processing, human and animal nutrient utilization, consumer food choices, and economic impacts of designed food to support optimal nutrition. The fiscal year 1999 grant supports research efforts of 30 investigators from seven disciplines through June 2000. CSREES requested that the university submit a grant proposal for fiscal year 2000 which is now under CSREES merit review.

Mr. Skeen. According to the principal researcher, what is the national, regional or local need for this research?

Response. The research addresses food quality, nutrition and optimal health. Much of the research focuses on improving the nutritional quality of foods important to the economy of the Midwest, while making those improvements economically feasible. Ongoing research focuses on increasing health protective lipids and plant chemicals in human foods. Such foods have recently been called functional foods and the development of functional foods is of high priority to the food industry. Recent strategies have included genetic modification of plant foods for animal and human diets.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the Center for Designing Foods to Improve Nutrition, the administrative unit for this grant, is to improve human nutrition and health maintenance by determining how to improve animal and plant food fat content and how to increase availability of health-protectant factors in the human food supply.

The Center's research group on soybean health effects has established an international reputation for the soybean isoflavone database. Studies of

isoflavone absorption and bioavailability indicated different human phenotypes in the intestinal breakdown of isoflavones. Ongoing studies are determining genetic and environmental factors responsible for these differences. Results suggest that consumption of soybeans with isoflavones during menopause help to maintain bone density. One project focuses on the structural features of flavones and related compounds that are effective in preventing colon cancer. Results suggest that combining flavonoids at low doses may enhance the ability in prevention of colon cancer.

Additional projects are focusing on other phytochemicals that are widely distributed in plant foods and may account for many of the beneficial properties associated with eating fruits and vegetables. Another project has identified a bioactive compound from cinnamon that may potentiate the action of insulin to help overcome insulin resistance in type II diabetics. Recent research using the Center's unique analytical facilities determined that a normal dietary intake of the carotenoid, lutien, interferes with the generation of vitamin A from beta-carotene, a major carotenoid precursor for vitamin A.

Other accomplishments include development of strategies for enriching yogurt, milk, eggs and pork with conjugated linoleic acids commonly called CLA. These compounds have unique cancer preventive properties and are derived from animal fats. Eggs were shown to be a particularly good human food for increasing dietary CLA. Other ongoing research identified fractions of human milk that enhance iron absorption by human colon cells. Such a milk factor was long expected to be responsible for the unique high iron absorption by human infants fed mothers' milk. The identification of this factor will have important benefits for infant feeding and for improving iron fortification. In the area of behavior modification, Center scientists developed a two-credit college course for freshmen that successfully prevented weight gain, whereas control students who did not participate gained 7.8 kilograms over the sixteen-month study period.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 with an appropriation of $300,000. The fiscal years 1992-1993 appropriation was $500,000 per year; $470,000 in fiscal year 1994; $473,000 per year in fiscal years 1995 through fiscal year 2000. A total of $4,608,000 has been appropriated.

Mr. Skeen. What are the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $293,000 university, $312,869 industry, and $14,000 miscellaneous in 1991; $90,000 state appropriations, $473,608 university, $131,160 industry, and $116,560 miscellaneous in 1992; $307,500 state appropriations, $472,081 university, and $222,267 industry in 1993; $486,000 university and $254,000 private in 1994; $210,000 university and $200,000 private in 1995;

$613,770 university and $207,811 private in 1996; $690,736 university and $458,000 private in 1997; $502,124 university and $700,000 private in 1998; and $363,000 university, $3,109,000 private and $2,617,000 other federal in 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the Center for Designing Foods to Improve Nutrition, Iowa State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original overall objective to design foods to improve nutrition is continuing to be addressed. A new set of related objectives will be completed in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The grant proposals for fiscal years 1998 and 1999 have undergone extensive scientific peer review by the grantee. Progress and objectives were further reviewed in May 1999, by the Center's newly formed External Advisory Council and their recommendations are being implemented.

HUMAN NUTRITION, LOUISIANA

Mr. Skeen. Please provide a description of the work that has been funded under the Human Nutrition, Louisiana grant.

Response. Obesity remains a worldwide epidemic. The grant entitled "Dietary Fat and Obesity" examines three aspects of this problem. Will the replacement of dietary fat reduce body weight in overweight men? Will fluctuations in daily fat intake influence the ability to use fat? How do good and bad fatty acids produce their differences?

Mr. Skeen. According to the principal researcher, what is the national, regional or local need for this research?

Response. If dietary fat plays a role in the epidemic of obesity, reducing fat intake might help alleviate its consequences. In collaboration with industry, the effects of a commodity-derived fat substitute made from sugar and soybean oil, which can lower the intake of available fat, is under investigation.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The overall goal of this grant is to identify the basis for the susceptibility to obesity of people who eat high-fat diets and to understand

how they differ from those people who are resistant to becoming obese when eating a high-fat diet. In the first project, researchers have just completed a year-long feeding study in which one group received a standard diet that was compared with two low-fat diets. The data that are now being analyzed suggest that overweight men lose weight when eating the special commodity-derived fat replacement, but not when eating a standard diet. In the second project, studies on the effect of varying the intake of fat from day to day suggest that the adaptation is similar to a single change. This implies important sensing mechanisms respond rapidly but are not well understood. Data from the third project, dealing with dietary fatty acids and insulin sensitivity, clearly show that trans fatty acids acutely increase insulin secretion and/or reduce insulin clearance, and that this effect is more pronounced in people with certain genetic characteristics. Longer-term feeding studies with trans fatty acids in healthy young men and women showed that trans fatty acids do not have strong effects on insulin action if a low-fat diet is consumed.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991, and the appropriation for fiscal years 1991-1993 was $800,000 per year and for fiscal years 1994-2000 was $752,000 per year. A total of $7,664,000 has been appropriated.

Mr. Skeen. What are the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $523,100 state appropriations in 1991; $515,100 state appropriations and $2,216,606 private in 1992; $536,100 state appropriations and $940,000 private in 1993; $627,000 state appropriations and $3,775,000 private in 1994; $546,100 state appropriations and $3,100,000 private in 1995; $1,471,000 state appropriations and $2,488,000 private in 1996; $1,998,000 state appropriations and $2,104,000 private in 1997; $987,000 state appropriations and $1,892,000 private in 1998; and $1,004,000 state appropriations and $3,136,000 private in 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the Pennington Biomedical Research Center, Louisiana State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original overall objective was to understand the relationship of dietary fat to the development of obesity, and this objective hasn't changed. The anticipated completion date for the specific related objectives is 2001. The objectives to be completed over the remaining time

of the grant will be reviewed by an external advisory team.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. In March 1999 an on-site panel of researchers evaluated the proposed objectives and experimental protocols. The critiques from this site visit were used to revise the final proposal. Another site visit is planned in 2000 to assess the progress, and evaluate a new set of relative objectives, and future research protocols.

HUMAN NUTRITION, NEW YORK

Mr. Skeen. Please provide a description of the work that has been funded under the Human Nutrition, New York grant.

Response. This grant continues to bring together investigators who focus on issues that range from improving our understanding of key roles of nutrients at the molecular level to the development of improved strategies to enable consumers to adopt newly created knowledge easily and effectively. At the molecular end of the spectrum, emphasis is given to nutrient-gene interactions and at the consumer end, emphasis is given to the role that a supportive environment plays in enabling consumers to make desired changes in their eating patterns. The fiscal year 1999 grant supports research through September 2000 and the focus shifted to address the individualization of nutrient requirements from a broad multidisciplinary perspective.

Mr. Skeen. According to the principal researcher, what is the national, regional or local need for this research?

Response. In the past decade, and in particular the past five years, there has been an explosion of knowledge concerning individual differences in the genetic control of metabolism which underlay disease processes and health maintenance. Because metabolism cannot exist without the provision of nutrients, and because nutrients influence genetic control, an understanding of genomics is fundamental to the development of nutritional sciences, from the biological to the social. Further, knowledge of individuality will become critical for the development of appropriate nutrition programs and policies, ranging from food system concerns, to the philosophy and design of dietary guidelines and guidance, to the implementation and evaluation of food assistance programs. For all of these applications there is a need for an integrated consideration of individual differences, not just in biology, but also in personal and cultural experience with food and other lifestyle and environmental exposures.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. Dietary Guidelines emphasize a reliance on plant-based foods. This emphasis is designed to control caloric consumption, reduce fat intake, modify the composition of ingested fats, enhance the consumption of foods associated with reduced cancer risk and simultaneously insure that nutrient needs are met in the proportion that is recommended. The researchers continue to address information gaps that relate to these health goals and to the policy aims for their implementation and that limit the more effective enhancement of consumer practices. This grant supported 25 research and outreach projects over the past year including 14 new awards in fiscal year 1999.

Selected highlights of the work in community outreach included the expansion of the Sisters in Health program to ten additional counties in New York State. This research-based nutrition education program encourages low income women to eat more fruits and vegetables through active experiences with foods in a positive social setting and has reported a 30% increase in fruit and vegetable consumption by participants. Another project supported the Community Food Security planning sessions that were held in six counties in New York State. Members of the groups have incorporated the insights and plans obtained from these sessions into their existing programs and activities.

The new initiative in genomics led to a study of the regulation of folate metabolism during neural development in a mouse model system. Disruption in folate metabolism due to nutritional deficiency and/or genetic predisposition is responsible for the occurrence of approximately 60 to 70 percent of neural tube birth defects including spina bifida. Using transgenic and gene knock-out approaches, researchers identified key genes that regulate folate metabolism exclusively during neural development. They are elucidating the molecular association between certain genes and nutrient status in the disease process, thereby defining the relative contribution of both nutrition and genetics in these folate-related birth defects. Other work in genomics include a study of the potential role of Receptor Associated Protein as a chaperone of lipoprotein lipase by employing mice with deletion of a critical gene. Lipoprotein lipase is a pivotal enzyme that regulates lipid metabolism. The enzyme is found mainly in adipose tissue and muscles but not in the liver. Recent work may have identified the molecular basis for the lack of expression of this enzyme in the liver.

Mr. Skeen. How long has this work been underway, and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $450,000; fiscal years 1990-1991, $556,000 per year; fiscal years 1992-1993, $735,000 per year; fiscal year 1994, $691,000; fiscal years 1995-2000, $622,000 each year. A total of $7,455,000 has been appropriated.

Mr. Skeen. What are the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were

as follows: $154,056 state appropriations and $2,456 private in 1991; $238,430 state appropriations and $60,746 private in 1992; $19,401 state appropriations and $22,083 private in 1993; $202,441 state appropriations and $1,175 private in 1994; $296,794 state appropriations in 1995; $348,127 in state appropriations and $39,593 private in 1996; $133,162 state appropriations in 1997; $8,185 university appropriations, $166,752 state appropriations, and $7,905 private in 1998; and $6,395 university appropriations, $164,244 state appropriations, and $7,414 private in 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Cornell University, New York.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original overall objective to integrate nutrition goals and food systems is continuing to be addressed in fiscal year 1999. The university changed the focus to complement the university's initiative in genomics and to human and social science issues that relate to food and nutrition. Progress has been consistent with the proposed time lines. They anticipate completing the specific related objectives in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES made a site visit on May 27, 1999, to evaluate the change in focus. The grant proposal for fiscal year 1999 was also subjected to independent peer review coordinated through the Cornell Agricultural Experiment Station. Based on reviewer recommendations, two proposed objectives were not funded and modifications were made to experimental designs of other projects.

HYDROPONIC TOMATO PRODUCTION, OHIO

Mr. Skeen. Please provide a description of the research that has been funded under the Hydroponic Tomato Production, Ohio grant.

Response. The Cooperative State Research, Education, and Extension Service has requested the university to submit a grant proposal that has not yet been received. Cultural practices, greenhouse design, and economics will be evaluated for Ohio and adjacent areas. Tomato production will be evaluated as an alternative enterprise to other crops.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The research is needed to develop and evaluate management protocols for economical production of green houses tomatoes as an

alternative crop for Ohio and adjacent areas.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research is to provide recommendations for management systems for successful operation of green house tomatoes as an alterative crop.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 and the appropriation for fiscal year 1998 was $140,000, and for fiscal years 1999 and 2000 is $200,000 each year. A total of $540,000, has been appropriated.

Mr. Skeen. What is the source and amount of non-federal provided by fiscal year?

Response. The non-federal funds provided for support of the project are $19,400 for fiscal year 1998 and $24,500 for 1999.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted by the Ohio State Agricultural Experiment Station at selected locations in Ohio.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigator for this project anticipates completion of the original objectives in fiscal year 2002. New objectives related to grass breeding are projected for completion in 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was subjected to a peer review in the institution and again reviewed by the agency National Program Leader when initialed in 1998.

ILLINOIS-MISSOURI ALLIANCE FOR BIOTECHNOLOGY

Mr. Skeen. Please provide a description of the research that has been funded under the Illinois-Missouri Alliance grant.

Response. The Illinois-Missouri Alliance has initiated a competitive grants program in agricultural biotechnology for research in targeted priority areas of need related to corn and soybeans. The scope of interest

includes production, processing, marketing, utilization, inputs and support services, along with economic, social, environmental, and natural resource concerns. The Alliance has solicited research project proposals from scientists at Illinois and Missouri and other midwestern institutions, and has conducted peer reviews for science quality, commercial feasibility and potential economic impact to select the proposals that will be funded. In 1999 the Alliance awarded three new research grants at three institutions totaling $590,000.

In 1998 the Alliance started an on-line magazine called AgBioForum devoted to the economics and management of agricultural biotechnology. The purpose of AgBioForum is to provide unbiased timely information and new ideas leading to socially responsible and economically efficient decisions in science, public policy, and private strategies pertaining to agricultural biotechnology. In its first year of operation, AgBioForum experienced over 145,000 hits from individuals in universities, industry, government, and international organizations.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal investigator has indicated that the goal of the Alliance is the pre-commercial development of emerging biotechnology discoveries for agriculture. The midwestern region produces more than half of the nation's output of corn and soybean crops, and is critical to domestic food security and United States competitiveness in global agricultural markets. Alliance grants are awarded on a regional basis to advance corn and soybean production in the Midwest. The Alliance is implementing a research strategy that it hopes will generate important biotechnological developments that are rapidly adaptable to unique local soil, climatic and socioeconomic conditions of the region. Alliance grants are awarded to projects with a clearly defined marketable product or service derived from biotechnology research.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. Fiscal year 1999 was the fifth year of funding for the Alliance. The research program focuses on the two major commodity crops, corn and soybeans, as produced, processed and marketed in the midwest. The goal of this biotechnology program is to fund integrated research and development projects that will lead to specifically defined practical technologies for commercialization. The projects funded in fiscal year 1999 include efforts to: 1) engineer maize to produce an isoflavone that is important in human health, 2) develop molecular markers for resistance of soybean to the sudden death syndrome fungus and then move resistance into commercial cultivars, and 3) to develop the genetic basis for asexual seed production in tripsicum, a close relative of maize.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through 2000?

Response. The work supported by this grant began in fiscal year 1995. The appropriations for fiscal years 1995 and 1996 were $1,357,000 each year, for fiscal year 1997, $1,316,000, and for fiscal years 1998 through 2000, $1,184,000 per year, bringing the total appropriations to date to $7,582,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The Alliance has not specified a required amount of matching funds, but it is expected that most projects will have commitments for significant direct and in-kind non-federal support. Since Alliance projects are still underway, the exact amount of the non-federal contribution is still unknown. The non-federal contribution is expected to be substantial, and a system for accounting for future non-federal contributions is in place.

Mr. Skeen. Where is this work being carried out?

Response. The research projects identified for funding in fiscal years 1995 through 1999 are being conducted at the University of Illinois, the University of Missouri, Iowa State University, Northwestern University, Southern Illinois University, and the Agricultural Research Service.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Each project proposal for Alliance funding has a target date for completion. The four initial projects were three-year studies with anticipated completions at the end of fiscal year 1998. Most of the second and third rounds of projects are also three-year studies with anticipated completions at the end of fiscal years 1999 and 2000, respectively.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Illinois-Missouri Biotechnology Alliance was evaluated for scientific merit by an agency peer review panel on February 25, 1999. The panel recommended approval of the project pending receipt of supplemental information on administrative aspects of the project. The supplemental information was received and we are satisfied that the program is being administered in compliance with the purpose of the grant. A peer review panel will be convened to re-evaluate the project upon receipt of a proposal for fiscal year 2000.

IMPROVED DAIRY MANAGEMENT PRACTICES, PENNSYLVANIA

Mr. Skeen. Please provide a description of the research that has been funded under the Improved Dairy Management Practices grant.

Response. The research focuses on developing methods to help dairy

farmers in the adoption of new technology and management practices which lead to improved dairy farm profitability. Individual research projects funded by the grant are determined by a competitive peer review process administered by the Institution using peers from Institutions located primarily in other States.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the local need is for the identification and implementation of profit enhancing management strategies for Pennsylvania dairy farms in response to changing market conditions and emerging technologies. The current focus is to develop economically-viable solutions to issues confronting Pennsylvania dairy farmers such as dealing with animal waste in an environmentally-friendly manner, reducing the cost of forage production systems, including grazing systems, and to develop a better understanding of decision processes by dairy farmers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goals of this research remain the same, which is the development of methods to help dairy farmers in the adoption of new technology and management practices which lead to improved dairy farm profitability. A farm management survey is complete and analysis of results is in progress. Farm financial models have been developed and are undergoing a field test on selected farms. Workshops to teach elements of business management to dairy farmers have been conducted, and survey instruments are in place to monitor effectiveness of workshops. Research is currently underway to develop improved models for nutrient management on northeastern dairy farms, to evaluate the potential role of intensive grazing systems to replace harvested forage, and to better understand how decisions are made by dairy farm families. Refinement of an expert computer-based system to assist dairy farmers in controlling the udder disease, mastitis, is underway. A study to evaluate the induction of lactation on dairy profitability is underway. An additional study to evaluate the impact of improved protein nutrition during late gestation on dairy cow performance has been initiated.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1992 and the appropriation for fiscal years 1992 and 1993 was $335,000 per year. The fiscal year 1994 appropriation was $329,000 and $296,000 each year in fiscal years 1995-2000. A total of $2,775,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. During fiscal year 1992, $354,917 were from State funds, and $16,000 from Industry, for a total of $370,417. During fiscal year 1993,

$360,374 were from State funds and $16,000 from Industry for a total of $376,374. Information is not available for fiscal years 1994-1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Pennsylvania State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal researcher anticipated completion of the original objectives by March 1994. The original objectives were met. Availability of continued funding has permitted the institution to develop a competitively awarded grant program within the institution to address priority issues related to management of dairy farms. Proposals are reviewed and ranked by peers from other institutions prior to award. It is anticipated that awards from the fiscal year 2000 appropriation will be complete in September 2002. Keeping with the Administration's policy of awarding research grants competitively, no further Federal funding for this grant is requested.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency accepts technical review of specific proposals funded by this grant on an annual basis. The overall proposal is review by the agency on an annual basis. In addition, technical staff has conducted on-site review of the program in 1993 and in 1995. The overall objective of the work funded by this grant has direct relationship to the development of Integrated Management System as well as to aspects of animal production systems on animal well-being and impact on the environment.

IMPROVED EARLY DETECTION OF CROP DISEASE, N.C.

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal investigator is preparing to submit a proposal, but at this time no additional information is available.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $170,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are not known at this time.

Mr. Skeen. Where is the work being carried out?

Response. Research will be conducted at the University of North Carolina-Greensboro.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This is a new grant.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This is a new project that will undergo merit review when received.

IMPROVED FRUIT PRACTICES, MICHIGAN

Mr. Skeen. Please provide a description of the work that has been done under the improved fruit practices grant.

Response. Funds from this grant will be awarded competitively to scientist at Michigan State University working with these crops. This research will involve a multidisciplinary approach to reduce chemical use on apple, blueberry, and sour cherry, three important Michigan fruit crops, and improve the management of dry edible beans and sugar beets. Research will be conducted on crop management techniques and reduced chemical use.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes Michigan's need for this research is to develop and maintain/expand their tree fruit and small fruits industry. There is a need to improve the culture and management of dry edible beans and sugar beets.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The planned objectives of the research are to reduce the chemical contamination of the environment from fruit production and improve production practices for beans and beets through multidisciplinary research, including pesticides, and the development of new nonchemical production

methods.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $494,000, and for fiscal years 1995-2000, $445,000 each year. A total of $3,164,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant in fiscal year 1994 were $437,338 from state appropriations and $135,000 from industry, for fiscal year 1995 were $574,494 from state appropriations and $127,000 from industry and a total of $908,969 for 1996. The non-federal funds for 1997 totaled $752,500. The non-federal funds for 1998 total $729,145, and for 1999 $1,332,300.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at Michigan State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Principal Investigators have reported significant progress toward improved cultural practices for these speciality crops which is expected to reduce the need for chemical pesticides, and expect to complete the original objective by the end of fiscal year 1999. Long-term goals are expected to take an additional five years with a projected completion date of 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project has not been subjected to a comprehensive review. The annual proposals including all of its sub projects are subjected to peer review before submission to the Cooperative State Research, Education, and Extension Service before they are approved. The project has progress toward the objective of developing management practices and strategies for economical production of specialty crops in Michigan with reduced chemical pesticide use.

This program is evaluated at the end of each research cycle and priorities adjusted for the next years funding. The evaluation is performed by scientists at Michigan State University.

INFECTIOUS DISEASE RESEARCH, COLORADO

Mr. Skeen. Please provide a description of the research that has been conducted under the Infectious Disease Research, Colorado grant.

Response. The purpose of this project is to establish a multidisciplinary research center to study infectious animal diseases which have a critical economic impact. The "Center for Economically Important Infectious Animal Diseases" will work collaboratively with universities and state and federal agencies. The focus will be on the impact of such diseases on international trade.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for the research?

Response. The need for this research is to provide valid risk assessment models for diseases which affect international trade and animal and public health. Livestock producers and the industry need this type of information to enable them to make correct disease management decisions. The Center will utilize commodity advisory groups to prioritize specific disease problems and will focus on those diseases with the greatest potential for economic impact.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to establish a regional center that will foster interactive work on risk assessment, disease control, and minimize the economic impact of disease outbreaks in livestock. The Center has been successful in obtaining additional funding from a variety of sources to initiate studies on diseases such as vesicular stomatitis and tuberculosis. The coordinating structures have been established and the Center is poised to make excellent progress during the next year.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999 with appropriations in fiscal year 1999 of $250,000 and in fiscal year 2000, $255,000, for a total of $505,000.

Mr. Skeen. What is the source and amount of non-federal funds by fiscal year?

Response. In fiscal year 1999 the project also received the following funds: other Federal agency grants, $85,750; private foundation grants, $39,488; state, $33,120.

Mr. Skeen. Where is this work being performed?

Response. The research is being conducted at the College of Veterinary Medicine, Colorado State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date is 2003. The work is proceeding on the designated schedule and it is expected that the objectives will be met in a timely manner.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of it.

Response. Because the project was just initiated in fiscal year 1999, no evaluation has been done at this time. However, the first review will be conducted later in fiscal year 2000, on the first anniversary of the initiation of the project.

INSTITUTE FOR FOOD SCIENCE AND ENGINEERING, ARKANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the Institute for Food Science and Engineering grant.

Response. As the flagship center for the Institute of Food Science and Engineering, the Center for Food Processing and Engineering has as its objectives to facilitate and encourage value-added research and improve the processing of agricultural products.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the Institute will provide technical support and expertise to small and mid-sized food processors that usually do not possess adequate expertise in-house. The economy of the southern region will be improved through the creation of new jobs and a high multiplier effect from the research. The Institute will develop and disseminate scientific information and provide educational programs related to value-added further processing, storage and marketing of food products. These efforts will assure food safety, improve the sensory and nutritional quality of food and meet the nutritional requirements and food preferences of a changing society.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to establish an Institute of Food Science and Engineering at the University of Arkansas-Fayetteville. The Institute for Food Science and Engineering and the Center for Food Processing and Engineering are operating. Research projects at the Center include: postharvest management practices for rice, such as studies of physicochemical properties, bacterial load of rice products, and milling systems, and development of methods to improve the texture and dill flavor of pickles, and the color of acidified pickled vegetables, with estimated

impact to the pickle industry of $500,000 annually. Researchers have developed 12 mechanized systems for total vineyard mechanization which maintain or improve juice and wine quality. Research on physicochemical properties of potatoes and bitterness in carrots and have had estimated economic impacts of several million dollars. Research on elecrochemical flow-through systems for chicken processing water and near infrared/ mid-infrared imaging for large scale fruit processing have important applications in industry. Institute staff, including the Descriptive Sensory Panel, have assisted both national food processing companies and small commercial kitchens in process development, with an impact of up to $2,000,000 annually on the Arkansas vegetable processing industry. The Institute's Center of Excellence presents workshops in the United States as well as planning train the trainer courses in Mexico and Central America to improve the safety of imported fresh fruit and vegetables. To date, 70 publications, two IMPACT reports and a quarterly newsletter have served to keep the industry and fellow scientists informed of research and technology transfer activities.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1996. The appropriation for fiscal years 1996 and 1997 was $750,000 each year, $950,000 for fiscal year 1998, and $1,250,000 each for fiscal years 1999 and 2000. A total of $4,950,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The non-federal funds and sources provided for this grant include $184,700 in state funds and $93,000 from industry in fiscal year 1996, and $187,357 in state funds and $320,403 industry funds in fiscal year 1997. Thus far in fiscal yea~ 1998, industry has provided $93,599, with firm commitments of an additional $55,000. The state has also provided facilities and administrative and clerical support estimated at $303,694 through June 30, 1998. The Institute has also received $48,000 to establish the Food and Agriculture Organization Center of Excellence.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the University of Arkansas at Fayetteville.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The principal researcher anticipates that work will be completed on the original goals in fiscal year 2002. The goals of this project related to establishing the centers of the Institute have not been fully met. The Center for Food Processing and Engineering and the Center for Food Safety and Quality are in operation; activation of the Center for Human Nutrition is scheduled for

1999. The objectives related to research and service to industry, food entrepreneurs and the general public would continue to be ongoing.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. In a review of the proposal on April 14, 1999, the assessment was that satisfactory progress was demonstrated in meeting the goals of the Institute.

INTEGRATED PEST MANAGEMENT

Mr. Skeen. Please provide a description of the research that has been funded under the Integrated Pest Management research grant.

Response. This research grant develops new pest management tools to address critical pest problems identified by farmers in an agricultural production region. Funds are distributed through the Regional Integrated Pest Management--IPM--Grants Program, which provides competitively-awarded grants to develop new pest management tactics to replace management tools lost as a result of regulatory action, pest resistance, and other factors. The Regional IPM Grants program supports research and extension projects that identify new pest management tactics, validate the effectiveness of new tactics in a production setting, and help producers implement these tactics by providing education and training programs. Proposals submitted to the Regional IPM Grants Program undergo technical and merit review at the regional and national levels.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research.

Response. The ability of the Nation's agricultural production system to keep pace with domestic and global demand for food and fiber is dependant on access to safe, profitable, and reliable pest management systems. For a variety of reasons, including the Food Quality Protection Act of 1996--FQPA--and pest resistance, many of the chemical control options farmers and other pest managers have relied on for many years are no longer available. The loss of these important tools is likely to continue at an accelerated rate over the next several years, and will have significant impacts on pest management systems in the United States over the next decade. The "minor use" crops--high value crops grown on relatively few acres--will be particularly hard hit during this period. For these reasons and others, it is essential that farmers be provided with new pest management tools and better information so they can remain competitive in today's global marketplace. These research grant funds are an important part of the Department's plan to assist farmers in finding effective pest management alternatives so they can adjust to changes in pesticide availability resulting from implementation of FQPA.

Mr. Skeen. What was the original goal of this research and what has been

accomplished to date?

Response. The goal of this research is to provide farmers with new pest management options that allow them to reduce dependance on pesticides, improve profitability, and protect vital natural resources. The research supported by this research grant has made important contributions to increasing knowledge about new approaches to pest management, but the need for continued investment in this area of research is greater than ever. The following are some accomplishment examples:

- - In Massachusetts, an Integrated Pest Management approach for fresh sweet corn was developed using early season applications of Bacillus thuringuienses followed by an application of vegetable oil. This system is effective and economical and meets the requirements for organic production and allows small-acreage sweet corn growers to produce the crop without relying on insecticides.

- - In Arkansas, a "friendly" fungus was discovered that attacks cotton aphids, a major pest of cotton. The aphid fungus saves Arkansas cotton growers millions of dollars each year by reducing the need to apply aphid insecticides.

- - In Kentucky, researchers developed a simple management system for Japanese beetles that allows landscapers to determine the optimum timing for insect management. This management system has resulted in better use of resistant varieties and has reduced pesticide use.

Mr. Skeen. How long has this work been underway and how much as been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1981, $1,500,000; fiscal years 1982 through 1985, $3,091,000 per year; fiscal years 1986 through 1989, $2,940,000; fiscal year 1990, $2,903,000; fiscal year 1991, $4,000,000; fiscal years 1992 and 1993, $4,457,000 per year; fiscal year 1994, $3,034,000; and fiscal years 1995-2000, $2,731,000 each year. A total of $60,861,000 has been appropriated since fiscal year 1981.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. A study of the sources of non-federal funds that contribute to this research effort was conducted in 1993-94 with the following results. In fiscal year 1993, state appropriations, $841,017, product sales, $33,987, industry grants, $17,081, and other, $31,737; for fiscal year 1994, state appropriations, $2,303,458, product sales, $77,157, industry grants, $210,110, and other, $216,552. These studies, which have not been repeated since 1994, demonstrate a trend toward greater annual state investments in Integrated Pest Management programs.

Mr. Skeen. Where is the work being carried out?

Response. Scientists in all states are eligible to compete for this funding

on a competitive basis. This research is currently being carried out by Colleges of Agriculture in more than 30 states.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Due to the passage of FQPA in 1996, the economic and environmental pressures facing U.S. agriculture today are at least as great today as they were in 1981 when federal funds were first appropriated for this research grant. It is important for government to address the needs of agricultural producers by supporting research and extension efforts to develop alternative pest management approaches. It is anticipated that the need for this work will only increase as new pests emerge, existing pests become resistant to current control methods, as new pesticide regulations are implemented, and as national and international markets shift.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Evaluation of this project is a continuous process. Projects funded by this research grant are awarded through a competitive process that includes relevance, technical, and merit review by multi-disciplinary panels. Progress reports are reviewed to evaluate accomplishments and special attention is given to studies involving new control strategies relating to at-risk sites with pest management usage patterns impacted by FQPA implementation.

INTEGRATED PRODUCTION SYSTEMS, OKLAHOMA

Mr. Skeen. Please provide a description of the research that has been funded under the Integrated Production Systems, Oklahoma grant.

Response. This grant focuses on the development of efficient management systems for production of watermelons and blackberries under intensively-managed conditions. The work will address biotic and abiotic production components under Southeastern Oklahoma conditions for use in production guidelines. This will include planting densities, fertilizer studies, weed management and insect and disease control.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for the research.

Response. The principal researcher believes the need for this research is focused on the local area of Southeastern Oklahoma, an area that is economically-depressed and in need of alternative crops to diversify the dominant cow/calf livestock production.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to develop new and

alternative crops to supplement and diversify the cow/calf livestock agriculture of Southeastern Oklahoma with emphasis on horticultural crops. Work to date has shown promise for strawberries, blackberries, cabbage, melons and blueberries. CD-ROM technology transfer to research results to support an expert system will be developed for grower use.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Work supported by this grant started in fiscal year 1984 and the appropriations were: fiscal year 1984, $200,000; fiscal year 1985, $250,000; fiscal year 1986, $238,000; fiscal years 1987-1989, $188,000 per year; fiscal years 1990-1991, $186,000 per year; fiscal year 1992, $193,000; fiscal year 1993, $190,000; fiscal year 1994, $179,000; fiscal years 1995-1998, $161,000 each year and fiscal years 1999-2000, $180,000 per year. A total of $3,190,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $165,989 state appropriations in 1991; $160,421 state appropriations in 1992; and $164,278 state appropriations in 1993. Non-federal support for 1994 was $141,850 for state appropriations. Funds for fiscal year 1995 were $129,552, for 1996 $146,000, for 1997 $152,000, for 1998, $148,000; and for 1999 $151,000.

Mr. Skeen. Where is this work being carried out?

Response. This research is being done at the West Watkins Agricultural Research and Extension Center at Lane, Oklahoma, a branch of the Oklahoma State Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives of this project were to develop production systems for alternative crops with economic potential for southeastern Oklahoma. Each year's funding cycle has addressed specific crop and management objectives to be completed over two years time. These short term objectives have been met for each of the completed two year projects. However the original objective of developing alternative cropping systems is very long term and have not been completed. The current project is projected for completion in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Each of the annual project proposals has been put through the institutions' review and is reviewed by an agency scientist before approval. In

addition to the annual review of individual proposals, a comprehensive review of the Lane Agricultural Center, where this research is conducted, was conducted in 1993. This review revealed that work supported by this grant is central to the mission of that station and represents an important contribution to the agriculture of the area.

This work has provided practical management information for farmers of southeastern Oklahoma that has improved their ability to economically-produce small fruit and vegetable crops. This project is evaluated internally at the end of each year in order to set priorities for the next year.

INTERNATIONAL AGRICULTURAL MARKET STRUCTURES AND INSTITUTIONS, KENTUDY

Mr. Skeen. Please provide a description of the research that has been done under the International Agricultural Market Structures and Institutions program.

Response. The International Agricultural Market Structures and Institutions project began late in fiscal year 1999 as a means of helping U.S. agriculture discover new ways to increase its global market share. The project analyzes food consumption trends and food distribution systems; evaluates the impact of actual and potential changes in local policies; identifies potential markets for food products produced in southern U.S. states.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. U.S. firms need to become more aggressive in international markets, but these markets are unfamiliar to many firms. The structure of international markets and the institutions that serve them are often different than in domestic markets, and the structures and institutions are continuously changing. Very few southeastern agribusinesses have the necessary research and intellectual resources to study international markets; they rely on their public institutions, such as the University of Kentucky, to assist them in discovering and exploiting export market windows.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to increase the international marketing success of American farmers and agribusinesses by increasing their understanding of international markets and the impact of policies that affect those markets.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999. The appropriation for fiscal years 1999 and 2000 was $250,000 a year. A total of $500,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funding for this grant was $135,000 from state appropriations in 1999.

Mr. Skeen. Where is this work being carried out?

Response. The work is being conducted at University of Kentucky in Lexington.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1999 was for a three-year project ending in 2002. Work is ongoing for the original objectives. Additional funds in 2000 will extend the project to 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This was a new project in 1999 when CSREES performed a merit review of the original proposal and noted that: "The University of Kentucky has faculty with expertise to conduct such a study. The principal investigator has been engaged in such work for several years, has conducted projects in other countries, and has been the university's director of international programs."

INTERNATIONAL ARID LANDS CONSORTIUM

Mr. Skeen. Please provide a description of the research that has been funded under the International Arid Lands consortium.

Response. Fiscal year 2000 is the seventh year that Cooperative State Research, Education, and Extension Service has funded the International Arid Lands Consortium. The Forest Service supported the program during fiscal year 1993 to develop an ecological approach to multiple-use management and sustainable use of arid and semiarid lands. Projects that began in 1996-1999 will continue to be funded to address issues of land reclamation, land use, water resources development and conservation, water quality, and inventory technology, and remote sensing. All proposals are peer reviewed and awarded competitively, whereby the principal investigator must be from a Consortium member institution.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the consortium is devoted to the development, management and reclamation of arid and semi-arid lands in the

United States, Israel, and elsewhere in the world. The International Arid Lands Consortium will work to achieve research and development, educational and training initiatives, and demonstration projects. The current member institutions are the University of Arizona, The University of Illinois, Jewish National Fund, Jordan's Higher Council for Science and Technology, New Mexico State University, South Dakota State University, Texas A&M University, Kingsville and Nevada's Desert Research Institute. Affiliate membership includes Egypt's Ministry of Agriculture and Land Reclamation Undersecretary for Afforestation. The United States Department of Agriculture's Forest Service works very closely with The International Arid Lands Consortium through a service-wide memorandum of understanding.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the Consortium was and continues to be acknowledged as the leading international organization supporting ecological sustainability of arid and semi-arid lands. To date, 63 projects have been funded, 43 of which are to conduct research and development, 11 for demonstration projects, and 9 for international workshops. Funds approximating $4.04 million have been used to fund these projects.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The International Arid Lands Consortium was incorporated in 1991. Funds were appropriated to the Forest Service in 1993. Additional funds were received during each of the years that followed. $329,000 has been appropriated from Cooperative State, Research, Education, Extension Service for fiscal years 1994 through 1998, and $400,000 for fiscal years 1999 and 2000 each for total appropriations of $2,445,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Members of the International Arid Lands Consortium have provided funds to support the Consortium office in Tucson, Arizona, and for printed materials as needed. Each member has provided travel and operations support for semi-annual meetings, teleconferences, and other related activities. In fiscal years 1993-1996, $60,000 in state appropriations were provided. Industry provided $84,083 and $100,000 in fiscal years 1993 and 1995, respectively. Additional funds of $34,000 were received during 1996 from the Egyptian affiliate member to enhance future collaboration. Funds of $50,000 from industry were received during 1998-1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is currently being conducted at the University of Arizona, South Dakota State University, Texas A&M University, Kingsville, New Mexico State University, University of Illinois, Nevada's Desert Research

Institute, and several research and higher education institutions in Israel, Jordan and Egypt.

Mr. Skeen. What was the anticipated completion date for the original objectives of the projects? Have those objectives been met? What is the anticipated completion date of additional or related objectives.

Response. All research and demonstration projects that started during 1993-1995 have been completed. The projects started in 1996-1997 are expected to be completed within 12 months depending upon the nature of the project. Projects started during 1998-1999 will be completed within 2 years. Several demonstration projects were completed and 6 international workshops were held during 1994 through 1999. The International Arid Lands Consortium is an organization with long-term goals.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The cognizant staff scientist reviews the project semi-annually and has determined that the research is conducted is in accordance with the mission of the agency.

IOWA BIOTECHNOLOGY CONSORTIUM

Mr. Skeen. Please provide a description of the work that has been funded under the Iowa Biotechnology Consortium grant.

Response. This Consortium is the focal point for cooperative biotechnology research endeavors between Iowa State University, the University of Iowa and the City of Cedar Rapids to recover and utilize byproduct materials arising from new and emerging industries in biotechnology with an emphasis on fermentation wastes and agribusiness. Both fundamental and applied research studies are being conducted to reduce the burden of agricultural bioprocessing wastes on municipal waste management systems and to transform components of these agricultural wastes into commercially viable products. The overall project involves a coordinated approach by a diverse group of investigators, and funding decisions for individual studies within each participating institution are based on a competitive peer review process with letter and panel evaluations.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The environmental burden associated with agriculture and the agricultural processing industries is recognized as a growing problem in the United States. These researchers believe that technological breakthroughs are possible to recover and recycle energy, chemicals, and materials from agriculture-related wastes. Although these principal investigators are working with wastes that are generated in the State of Iowa, similar waste streams are generated by agricultural industries across the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goals of this project were aimed at enhancing the recovery and utilization of by-product materials arising from new and emerging industries using biotechnology. Recycling agricultural wastes, isolating useful byproducts and developing value added processing remain the primary thrusts of the project. A cadre of scientists has been established by the Consortium to assist in finding uses for the by-product waste streams generated by agricultural processing. The Consortium is also making important progress in bioconversion, biocatalysis, membrane concentration, and bioseparation of by-products. Recently, new studies have been initiated on: value-added products related to culture of polysaccharide-producing bacteria; screening of agricultural seed processing fractions for biocatalysts; conversion of lignocellulose to lactic acid; the use of waste by-products as feeds for livestock and aquacultural species; composting strategies for waste streams; and exploitation of mico-organisms that colonize extreme environments found in food processing plants.

Mr. Skeen. How long has this work been under way and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $1,225,000; fiscal year 1990, $1,593,000; fiscal year 1991, $1,756,000; fiscal year 1992, $1,953,000; fiscal year 1993, $2,000,000; fiscal year 1994, $1,880,000; fiscal years 1995-1996 $1,792,000 each year; fiscal year 1997, $1,738,000; and in fiscal years 1998 through 2000, $1,564,000 each year. A total of $20,421,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds and sources provided for this grant were as follows: $623,803 from the State of Iowa, $42,813 from the city of Cedar Rapids in 1991; $768,287 from the State of Iowa, and $365,813 from the city of Cedar Rapids in 1992; $858,113 from the State of Iowa, and $170,000 from the city of Cedar Rapids in 1993; $841,689 from the State of Iowa, and $36,000 from the City of Cedar Rapids in 1994; $1,016,505 from the State of Iowa, and $36,000 from the city of Cedar Rapids in 1995; $862,558 from the State of Iowa, and $40,000 from the City of Cedar Rapids in 1996; $1,044,864 from the State of Iowa, and $50,000 from the City of Cedar Rapids in 1997; $303,549 from the State of Iowa, and $50,000 from the City of Cedar Rapids in 1998; and $293,461 from the State of Iowa, and $59,400 from the City of Cedar Rapids in 1999.

In addition, leveraging of Federal grant monies has been obtained in the form of industrial matching funds or contracts for related projects. Some of the more noteworthy awards are as follows: $20,000 from Archer Daniels Midland; $342,720 from Ajinomoto; $40,000 from BASF; $18,000 from Bluestem Solid Waste Agency; $1,748,975 from Cargill; $177,200 from Heartland Lysine, Inc.; $48,000 from Horizon Technology, Inc.; $75,274 from Iowa Corn Promotion Board; $65,200 from Iowa Energy Center; $80,273 from National Corn Growers Association, $25,000

from National Pork Producers Council; and $11,500 from PathoGenesis Corporation.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Iowa State University and the University of Iowa, in collaboration with the City of Cedar Rapids. In addition, field studies are being conducted at various sites through out Iowa, including the facilities of participating industries located in Cedar Rapids and other Iowa communities.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Consortium was originally created as a partnership between the City of Cedar Rapids and the participating universities to assist the City in dealing with wastes associated with corn and oat processing and milling, biocatalysis to produce high-fructose syrups, and one of the largest fermentation facilities in the world. More recently, new biotechnology industries have been attracted to Cedar Rapids and have added greatly to the volume of industrial waste streams. No firm date was established to complete this research at the beginning of the project. The researchers have worked closely with the City and the industries generating these agricultural wastes since 1989, and the nature of the studies has evolved as significant progress has been made in analyzing waste streams and in devising laboratory procedures for extracting useful products. The City of Cedar Rapids is planning to invest funds from other sources in special waste treatment facilities to conduct large scale tests of new treatment methods. Several years will be required to complete these tests and to refine separation technologies.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Iowa Biotechnology Consortium proposal is composed of a selected group of studies that are individually peer reviewed within the universities. Once the complete proposal is submitted to CSREES, it is again evaluated for scientific merit by an agency biotechnology peer panel that makes recommendations regarding approval for the award. The Iowa Biotechnology Consortium proposal for fiscal year 2000 has not yet been received, and once available a CSREES review panel will be convened to review and evaluate the proposed studies in the grant application and to make recommendations regarding overall approval of the project. In addition, the panel will assess progress during the past year as a part of the approval process and post-award management. A site visit was made by a National Program Leader to the research facilities of the University of Iowa during the past year, and the Program Manager is planning to conduct an on-site assessment of research at Iowa State University during the coming year.

IR-4 MINOR CROP MANAGEMENT

Mr. Skeen. Please provide a description of the research that has been funded

under the IR-4 Minor Crop Management grant.

Response. The Pest Management for Minor Crops (IR-4) Program is a highly effective effort between the State Agricultural Experiment Stations, CSREES, and the Agricultural Research Service. IR-4 provides the national leadership, coordination and focal point for obtaining data to support the regulatory clearance through the U.S. Environmental Protection Agency (EPA) for pesticides and biological control agents for specialty food crops such as fruits and vegetables as well as non-food crops like turf and ornamentals. In many cases, the agricultural chemical industry can not economically justify the time and expense required to conduct the necessary research for products with limited market potential. With assistance from IR-4, registration-related costs are manageable, and producers of a large number of small acreage crops such as vegetables, fruits, nuts, herbs and other specialized crops have access to necessary pest control products. In order to accomplish the above, a four step process has been developed. Step one involves research prioritization. Because of limited resources, IR-4 requests and receives input from stakeholders on potential research projects. Yearly workshops are conducted that involve growers, commodity organizations, university research and extension specialists, EPA staff and industry representatives to determine which projects are the most critical to minor crop agriculture. Step two is research planning. Research protocols are written after careful review and comments from stakeholders. Step three is research implementation. A typical IR-4 program consists of both field and laboratory phases. For the field work, researchers apply the crop protection chemical to the target crop according to the experimental protocol. The crop is harvested and transferred to the laboratories where the chemical residues in the crop, if any, are determined. All field and laboratory research is conducted under EPA Good Laboratory Practices. Step four is data submission and approval. The data are critically reviewed and formatted into a regulatory package and submitted to the EPA for their review. If appropriate, the EPA will approve the submission and grant a tolerance to use the chemical on the target minor crop.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This is a national effort which identifies needs by a network of users, commodity groups, and state university and Federal researchers. This research is highly significant to national and regional as well as local needs. The basic mission of IR-4 is to aid producers of minor food crops and ornamentals in obtaining needed crop protection products. IR-4 is the principal public effort supporting the registration of crop protection products and biological pest control agents for approximately $40 billion minor crop industry representing 40 percent of the total farm crop value in the U.S.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to obtain minor use pesticide registrations with a high priority placed on those pesticides classified as Reduced Risk, assist in the maintenance of current registrations and to assist with the development and

registration of biopesticides. For 1999, IR-4 submitted data to EPA that supported 632 new minor food use clearances. During the past three years, over 960 new minor food use clearance requests were submitted to IR-4 from growers, state and Federal scientists and extension specialists. The Food Use part of the IR-4 Program continues to have a high productivity which, according to EPA, supports 40 percent of all EPA pesticide registrations. Since the program's inception in 1963, IR-4 has been granted over 5000 food use clearances.

For ornamental crops in 1999, IR-4 submitted 532 pesticide clearance requests to EPA. Since 1977, IR-4 has assisted with the registration of over 7000 crop protection chemicals and biological pest control agents on nursery stock, flowers and turf grass. The ornamental industry accounts for over 25 percent or $11 billion of the total minor crop value in the US. Biopesticides have been an important IR-4 thrust since 1982. EPA granted 58 IR-4 supported biopesticide food use clearances in 1999 compared to 48 biopesticide clearances in 1998.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from appropriated funds as follows: Program redirection in fiscal year 1975, $250,000; fiscal year 1979, $500,000; fiscal years 1976-1980, $1,000,000 per year; fiscal year 1981, $1,250,000; fiscal years 1982-1985, $1,400,00 per year; fiscal years 1986-1989, $1,369,000 per year; fiscal year 1990, $1,975,000; fiscal year 1991, $3,000,000; fiscal years 1992-1993, $3,500,000; fiscal year 1994, $6,345,000; fiscal year 1995 through 1997, $5,711,000 per year; and fiscal years 1998 through 2000, $8,990,000 per year. A total of $79,499,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $891,856 state appropriations and $65,402 industry in 1991; $1,002,834 state appropriations and $104,292 industry in 1992; $1,086,876 state appropriations and $310,133 industry in 1993; $550,160 state appropriations, $408,600 industry, and $924,169 miscellaneous in 1994; $775,432 state appropriations, $266,714 industry, and $751,375 miscellaneous in 1995; and an estimated $800,000 state appropriations, $250,000 industry, and $800,000 miscellaneous in each years of 1996 through 1999.

Mr. Skeen. Where is this work being carried out?

Response. Field work is performed at the State and Territorial Experiment Stations. Laboratory analysis is conducted primarily at the California, New York, Florida and Michigan Agricultural Experiment Stations with assistance by the Puerto Rico, Hawaii, North Dakota, North Carolina, Washington, Virginia, and Idaho Agricultural Experiment Stations. Field Research Centers located in Hawaii, Oregon, Washington, California, Wisconsin, Michigan, North Dakota, South Dakota, North Carolina, Florida, Tennessee, Texas, New Jersey, New York, Maryland and New Hampshire conduct the field residue program. Protocol

development, data assimilation, writing petitions and registration processing are coordinated through the New Jersey Agricultural Experiment Station. Agricultural Research Service is conducting minor use pesticide studies at field locations in California, Georgia, Ohio, South Carolina, Texas, and Washington. Agricultural Research Service laboratories in Georgia, Maryland, and Washington are cooperating with analyses.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Selected categories of the Special Research Grants Program address important national and regional research initiatives. IR-4 is involved in research on biological systems that by their nature are ever changing and presenting new challenges to agriculture. The IR-4 workload is anticipated to be long term because of the sensitivities about food safety and the environment, and the eventual loss of a large number of conventional pesticide registrations for minor crops because of the 1996 Food Quality Protection Act - FQPA. The FQPA presents a serious challenge to minor crop pest management. It is estimated that there will be significant loss of conventional pesticide registrations for minor crops. IR-4 has developed a strategy to minimize the impact of loss of the critical pest control tools needed by our domestic minor crop growers. The IR-4 strategy involves the following factors: first, facilitating regulatory clearance of Reduced Risk pesticides for minor crops; second, when appropriate, develop risk mitigation measures for existing minor use registrations; third, assist with the registration of biologically-based pest control products for minor crops; and fourth, register and maintain pesticides essential to integrated pest management systems - IPM.

With the implementation of the 1995 Strategy Plan, IR-4 has achieved significant accomplishments. Since FQPA requires that the EPA review all of the almost 10,000 tolerances by 2006, it is anticipated that IR-4 program will have a significant challenge to help bring new crop protection solutions to minor crop growers well into the next century.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Each year the grant applications are peer reviewed and reviewed by CSREES' senior scientific staff. A summary of those reviews indicate excellent progress in achieving the objective of providing safe pest controls for minor uses. In December 1997, CSREES sponsored a Peer Review of the Project by a panel chaired by a retired Administrator of USDA-ARS and representatives from the USDA, EPA, commodity groups, the food processing industry, the crop protection industry and the land grant university system; a report was issued January 1998. The report covered the areas of response to FQPA, Project operations, accomplishments, good laboratory practices, the ARS companion program and future outlook with specific recommendations for each area. The review panel was "in unanimous agreement that IR-4 is a very successful program which serves an important need to producers of agricultural products for ultimate consumption by the American public. The program is effectively and

efficiently administered by a dedicated professional staff". The goal in 2000 and beyond will be to build on this basis and fully implement the recommendations of the panel. This review and previous reviews have resulted in significant improvement in the IR-4 program's productivity and quality of research. Additionally, the customers served by IR-4 have provided input to the program to enhance its effectiveness.

JOINTED GOATGRASS (Aegilops Cylindricum)

Mr. Skeen. Please provide a description of the research that has been funded under the Jointed Goatgrass grant.

Response. Research is conducted as sub-projects by more than 30 scientists in 10 western and mid-western states on systems for suppression of jointed goatgrass in winter wheat production systems. Research includes integrated cultural management, reduction of seed in the soil, identification of more competitive wheat varieties and crop rotations, and modeling to predict economic outcomes of changing management practices. The premier research projects continue to be four regional, long-term integrated management studies conducted across nine states. In these studies, various cultural control practices such as seeding rates, row spacing, planting dates, seed size, competitive varieties, fertilizer placement, crop rotations, and tillage practices are being evaluated as an integrated management system for the suppression of jointed goatgrass. Research is also being conducted on genetic diversity in the jointed goatgrass population, soil conditions responsible for persistence of jointed goatgrass seedbank, timing and intensity of tillage on seed persistence in the soil, gene flow between wheat and jointed goatgrass, identification of crop traits that make wheat more competitive against jointed goatgrass, and making the bioeconomic model more user friendly. All funded projects have a technology transfer component and a national extension coordinator insures that growers and extension personnel are fully informed about all options for the managing this devastating weed. The National Extension Coordinator is housed at Colorado State University.

Mr. Skeen. According to the research proposal or the principal researcher, what is the national, regional, or local need for this research?

Response. Jointed goatgrass infests nearly five million acres of winter wheat lands in the west and mid-west. Through the efforts of the national program, the rate of spread of this weed has decreased significantly in the past 5 years. However, jointed goatgrass still costs US wheat producers an estimated $145 million annually in lost yield, reduced quality, production of less profitable crops, increased management costs, and reduced land values. Control of jointed goatgrass in a standing wheat crop is impossible with currently available technology because seed survives in the soil for five years or more, and because jointed goatgrass is genetically related to wheat. Jointed goatgrass has increased rapidly in the past 25 years in part because of the widespread adoption of conservation tillage systems. Jointed goatgrass proliferated in such systems, and it greatly impedes the universal adoption of such practices. The principal investigator and the National Association of Wheat Growers believe this research is of high national and regional importance.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this project is to reduce the devastating effect of jointed goatgrass on winter wheat production and quality, and to prevent the spread of this weed into new, non-infested areas. Numerous individual cultural control practices have been evaluated in several states as to their effectiveness for the suppression of jointed goatgrass and on the growth and yield of wheat. Four regional, long-term integrated management projects have been established where three or more individual cultural control practices have been combined into an integrated management system for the suppression of jointed goatgrass in winter wheat. Results from these projects show that combining three or more individual cultural control practices into an integrated management system will suppress jointed goatgrass and improve the yield and quality of winter wheat. Significant progress has been made in understanding gene flow between wheat and jointed goatgrass. This information will be very valuable in managing the introduction of herbicide-resistant wheat for the control of jointed goatgrass. A bioeconomic model has been constructed that combines jointed goatgrass population biology information, weather data, and responses of jointed goatgrass and wheat to various cultural control practices, and predicts wheat yields, response of jointed goatgrass, and economic outcomes from changing production practices. In 1999, a symposium on jointed goatgrass was held as part of the Western Society of Weed Science meetings. At this symposium, ten papers were presented, outlining the latest research and technology transfer activities of this national program. Information presented at this symposium was used to establish new priorities for this program and to guide the program for the next five years. Since 1994, six regional symposia have been held to transfer to producers and extension personnel the latest information on the identification, biology and management of jointed goatgrass in winter wheat. A World Wide Web site (http://www.ianr.unl.edu/jgg) has been established and updated annually to further enhance information transfer. Also, a videotape, a poster and a slide set have been produced to assist extension personnel in transferring to producers information on jointed goatgrass biology and management.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grain began in fiscal year 1994. The appropriation for fiscal year 1994 was $329,000; for fiscal years 1995-1997, $296,000, each year; $346,000 for fiscal year 1998; and $360,000 in fiscal years 1999 and 2000 bringing the total appropriations to $2,283,000.

Mr. Skeen. What is the source and amount of no-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: for 1994, $82,198 state appropriations, $82,256 from industry, and $14,871 miscellaneous; for fiscal year 1995, $67,442 state appropriations, $38,496 from industry, and $13,304 miscellaneous; for each fiscal year 1996-1997, an estimated $70,000 state appropriations, $50,000 from industry, and

$14,000 miscellaneous; for 1998 $231,335 state appropriations, $42,570 from state wheat commissions, and $15,000 miscellaneous; and for fiscal year 1999, $258,122 state appropriations, $87,750 state wheat commissions, and $72,100 miscellaneous.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted by university scientists in 10 western states with serious infestations including Washington State University, who is the principal coordinating institution and receives the grant, Colorado, Kansas, Nebraska, Oklahoma, Utah, Oregon, Idaho, Montana, Wyoming, and South Dakota.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated to accomplish significant results in five years, and significant accomplishments have been made. However, the jointed goatgrass problem will require an additional five more years to accomplish all of the objectives and to have effective management practices available for producers to control jointed goatgrass in winter wheat.

Mr. Skeen. When was the agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Each year the sub-grants are peer reviewed for scientific merit and adherence to the program objectives by a panel of scientists and producers. The overall grant is reviewed annually by CSREES's scientific staff. Sub-contract grants to the various universities are awarded using a peer review process coordinated by Washington State University.

LIVESTOCK AND DAIRY POLICY, NEW YORK AND TEXAS

Mr. Skeen. Please provide a description of the research that has been done under the livestock and dairy policy program grant?

Response. The purpose of this grant is to assess the possible economic impacts on the U.S. livestock and dairy sectors from various macroeconomic, farm, environmental, and trade policies and new technologies. Both Cornell University and Texas A&M University conduct analysis of these policies and disseminate the information to policymakers, farmers, and agribusinesses. Cornell focuses on sector-level dairy policies, and Texas A&M focuses on policies affecting livestock and dairy at the farm level.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Information on the implications of new and alternative farm, trade, and macroeconomic policies affecting the livestock and dairy sectors is of special interest to policy- making officials, farmers, and others. Such

information enables farmers and agribusinesses to make necessary adjustments to their operations to enhance profitability and for national public officials to consider alternatives to sustain adequate supplies and minimize costs. The principal researchers believe this research to be of national, regional and local significance.

Mr. Skeen. What was the original goal of this research and what has been done to date?

Response. The original goal was to establish a specialized research program that could provide timely and comprehensive analysis of numerous policy and technological changes affecting livestock and dairy farmers and agribusinesses and advise them and policymakers promptly of possible outcomes. This goal has been achieved and the program continues to provide timely assessments and evaluations of provisions and proposed changes in agricultural policies, the General Agreement on Tariffs and Trade, and the North American Free Trade Agreement; various income and excise tax measures; and alternative pricing measures for milk. The institutions were integrally involved in several current studies relating to dairy provisions in the 1996 farm legislation. These studies contributed significantly to the development of proposed regulations called for in this legislation. Both institutions maintain extension outreach programs to disseminate results of their analysis throughout the United States. They have organized a national Dairy Markets and Policy Extension committee to advise and assist them in this effort. This latter committee was especially helpful to USDA in educating farmers about proposed milk marketing order changes last year.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $50,000; fiscal year 1990, $518,000; fiscal years 1991-1993, $525,000 per year; fiscal year 1994, $494,000; fiscal years 1995-1997, $445,000 each year and fiscal year 1999, $475,000; fiscal year 2000, $475,000. A total of $5,767,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $37,420 State appropriations in 1991; $162,086 State appropriations and $133,278 product sales for a total of $295,364 in 1992; and $301,817 State appropriations, $1,412 industry, and $7,121 miscellaneous for a total of $310,350 in 1993; $24,702 State appropriations, and $5,961 industry for a total of $30,663 in 1994; $235,526 State appropriations for 1995; $250,000 in State appropriations for 1996; and approximately $245,000 in State funding for 1997 and 1998.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted at Cornell University and Texas

A&M University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This program is of a continuing nature for the purpose of assessing existing issues and proposed policy changes affecting the livestock and dairy industries.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. We have conducted no formal evaluations of this project. Annual proposals for funding, however, are peer reviewed for relevance and scientific merit. Our agency contact is also in regular contact with principal researchers at each institution to discuss progress toward project objectives.

LOWBUSH BLUEBERRY RESEARCH, MAINE

Mr. Skeen. Please provide a description of the research that has been funded under the lowbush blueberry research program grant.

Response. Interdisciplinary research is being conducted on many aspects of lowbush blueberry culture and processing including investigations into factors affecting processing quality, biological control of insect pest, sustainable pollination, weed, disease, and fertility management, cold heartiness, and group water protection.

Mr. Skeen. According to this research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. Maine produces 99 percent of all lowbush blueberries or 33 percent of all blueberries in the United States. This work is of major local interest, and helps maintain the continued availability and high quality of this native fruit commodity.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original research goal was to provide answers to unique lowbush blueberry production, pest, and processing problems. Research to date indicates that the field sanitizer was able to use heat to control insect pests without adversely affecting plant growth, while providing a non-chemical alternative for pest management. Biological control agents were sued to control fireworms. Lowbush blueberry yields were increased by use of native and alfalfa leafcutter bees. Mechanical harvesting was found to be effective and had yields and fruit quality comparable to hand harvest, providing growers with a more efficient tool to harvest blueberries. Products for the use in food industry are being extracted from cull berries therefore improving utilization and reducing waste.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1990, $170,000; fiscal year 1991, $202,000; fiscal years 1992-1993, $185,000 per year; fiscal year 1994, $208,000; and fiscal years 1995-2000, $220,000 per year. A total of $2,270,000 has been appropriated to date.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Direct industry support was about $65,000 from 1996-2000 per year.

Mr. Skeen. Where is this work being carried out?

Response. Research is being carried out at the University of Maine.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives have not yet been met. The University of Maine researchers estimate that the project will be concluded at the end of fiscal year 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last agency merit review of this project was January, 1999. Research accomplishments included investigations of post emergence, grass specific herbicides to control weeds rather than the use of broad spectrum; timing of fertilization treatments and comparisons of various fertilizer combinations have indicated that fertilizers containing nitrogen increase yields. Other research accomplishments include the insect management of blueberry maggots through behavioral control and the use of less toxic chemicals from control of blueberry flea beetles.

MAPLE RESEARCH, VERMONT

Mr. Skeen. Please provide a description of the research that has been funded under the Maple Research Grant?

Response. The research is designed to increase understanding of the sources of heavy metal contamination in maple sap and syrup and explore methods of reducing or eliminating lead and other heavy metal contaminant levels in the finished product through alteration of manufacturing equipment and production practices.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local focus for this research?

Response. Maple products are an important cultural heritage, and a significant source of seasonal income in maple producing areas of rural America. Identifying sources of heavy metal contaminants during processing, and exploring methods to reduce or eliminate contaminants from maple products is important in assuring consumers that these food products are not harmful.

Mr. Skeen. What was the original goal of this research and what has been accomplished?

Response. The goal of this research is to conduct investigations on maple tree physiology, the ecology and management of maple stands, and related aspects of the maple syrup industry in Vermont and the Northeast. The primary goal of this work has been to identify and eliminate sources of lead and other heavy metal contaminants in maple syrup.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Work under this project began in fiscal year 1985. Annual appropriations in support of this project are as follows: fiscal year 1985 - $100,000; fiscal years 1986 and 1987 - $95,000 per year; fiscal years 1988 and 1989 - $100,000 per year; fiscal years 1990 through 1993 - $99,000 per year; fiscal year 1994 - $93,000; fiscal years 1995 through 1997 - $84,000 each year; fiscal years 1998 through 2000 - $100,000 per year. A total of $1,532,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal years?

Response. Non-federal fiscal support for this project is provided by two primary sources and one secondary source. The primary sources are state appropriations and product sales. The secondary source is local support, but that support is not available each year. The total non-federal contribution from these sources provides an average 86 cents for every dollar of federal funding. Early in the project the total non-federal contribution was 60 cents for every dollar and most recently one dollar, ten cents for every dollar of federal funding.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at the Vermont Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The work from this project, relative to maple tree physiology and management of maple stands has been completed. The objective of identify sources of heavy metals in maple syrup products and subsequently reducing them is underway. The anticipated completion date is 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Project proposals and progress reports are reviewed and evaluated annually by the U.S. Department of Agriculture. Satisfactory progress has been made on tree physiology and maple tree (sugar bush) management. Progressive work on identifying sources and controlling maple syrup contaminants is in place and is being monitored by the department.

MEADOWFOAM, OREGON

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. This funding will be used to: develop meadowfoam cultivars with increased seed yield, lodging resistance, oil concentration, and insect resistance; increase seed, field test and deploy several new experimental cultivars; enhance the genome map of meadowfoam; develop DNA markers for molecular breeding and genetic analysis in meadowfoam; and map genes affecting self-pollination, seed yield, oil content, and insect resistance. The proposal will be internally and externally reviewed for scientific merit. This research will be reviewed by state and federal scientists and administrators for merit and progress.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research is needed to increase the productivity of meadowfoam as an edible and industrial oilseed crop. Meadowfoam oil is a basic feedstock for lubricants, cosmetics, and personal care products. Oregon State University has recently developed a food grade meadowfoam oil that should open edible oil markets for this crop. This research is needed to expand the range of production of meadowfoam and to supply United States farmers with competitive cultivars (varieties) for commercial production.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to increase the productivity of meadowfoam as an oilseed crop for United States farmers. This research led to the development of a new variety of meadowfoam that outyielded existing cultivars by 800 kilograms per hectare in 1999. Seed increases and advanced field tests are underway for this cultivar. Significant progress was made on the development of high-throughput DNA markers for use in molecular breeding. These markers are being used to elucidate the genetics of several economically important traits in meadowfoam.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in 1999 and the appropriation for fiscal year 1999 was $300,000, and for fiscal year 2000, $300,000. A total of $600,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds have not been provided.

Mr. Skeen. Where is this work being carried out?

Response. The breeding research is being conducted at Corvallis, Oregon. Cultivars are being field tested at four sites in the western United States including Corvallis and Medford, Oregon, Mt. Vernon Washington, and Davis, California, and three sites in the eastern United States including Blacksburg, Virginia, and two as yet unspecified sites.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional and related objectives?

Response. The anticipated completion date for the original objectives is June 2001. Progress has been made towards each of the stated objectives; however, we are still in the middle of the first year and thus cannot fully report on progress. To date, the first field experiments were planted in October 1999 and will be harvested in July 2000. Results will be assessed after harvest.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Evaluation of this project will conducted annually based on the annual progress report and discussions with the principal investigator as appropriate. The evaluation is conducted by the cognizant staff scientist who has determined that research to date is in accordance with the mission of the agency.

MICHIGAN BIOTECHNOLOGY CONSORTIUM

Mr. Skeen. Please provide a description of the work that has been funded under the Michigan Biotechnology Consortium grant.

Response. The objective of the Consortium's research program is to develop bioprocessing technology to manufacture products from agricultural raw materials; to increase the utilization of agricultural raw materials; reduce agricultural surpluses; degrade agricultural and associated wastes, thereby decreasing environmental costs of agricultural products and processes; and to reduce the need to import foreign petroleum.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that the development of value-added products from agricultural raw materials will increase their utilization, reduce commodity surpluses and environmental costs and decrease the need for foreign petroleum thus contributing significantly to local, regional and national priorities. Biotechnology research of national significance could potentially be supported by competitive grants awarded under the National Research Initiative or the Initiative for Future Food and Agricultural Systems.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research is to select and develop market-viable technologies for the production of industrial products from agricultural raw materials. The Consortium has used funding from the Special Grants program to develop technologies now in the marketplace. Examples include the production of lactic acid from corn which resulted in the building of a $200 million plant in Nebraska. Agricultural resources were used as a feedstock for plant growth formulations that enhance productivity and reduce plant stress, biodegradable plastic resins for compostable films used in lawn/leaf litter bags, agricultural mulch films, etc., biodegradable plastic resins for injection molded products such as disposable cutlery, all-natural food flavors, calcium magnesium acetate deicer and biodegradable adhesives. The byproduct of cheese production (whey) was used to produce high quality, high value optically pure chiral intermediates for pharmaceuticals and agrochemicals.

A sand/manure separation system for dairy farms was developed to cost-effectively separate manure from sand and recycle both components. Numerous enzymes have been characterized and are now in use to provide value added modifications in the processing of agricultural products. Improved methods to clean up herbicides, pesticides and other agricultural materials have been developed. Many of the technologies developed have been commercialized through several licenses and eight new company startups.

Special Grant funding in fiscal year 1999 allowed the Consortium to develop high value animal feeds from agricultural residues, paint removers, biobased polymers for medical applications, liquid crystals and metals recovery, naturally occurring bioactive compounds and biocontrol agents, inks that are not hazardous aromatic products, fruit brandy, specialty mushrooms and methods to improve the economics of ethanol production. Funding also supported a technology transfer program that brought researchers from over 30 land grant universities, federal laboratories and state Departments of Agriculture together with Consortium researchers to review numerous commercially promising biobased agricultural technologies.

Mr. Skeen. How long has this work been under way and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $1,750,000; fiscal year 1990, $2,160,000; fiscal year 1991, $2,246,000; fiscal years 1992-1993, $2,358,000 per year; fiscal year 1994, $2,217,000; fiscal year 1995, $1,995,000; fiscal years 1996 and 1997, $750,000

per year; and fiscal years 1998 through 2000, $675,000 per year. A total of $18,609,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds provided for this grant were as follows: $1,750,000 - State of Michigan, $160,000 - industry and $1,000,000 from miscellaneous in 1991; $1,750,000 - State of Michigan, $175,000 - industry and $1,000,000 from miscellaneous in 1992; $1,750,000 - State of Michigan, $100,000 from industry in 1993; $1,750,000 - State of Michigan, $175,000 - industry and $100,000 from miscellaneous in 1994; $200,000 - State of Michigan, $2,035,000 from industry in 1995; $1,250,000 - State of Michigan, $350,000 - industry and $6,000,000 from miscellaneous in 1996; $402,000 - industry and $10,000,000 from miscellaneous in 1997; $500,000 - State of Michigan and $1,060,000 from industry in 1998; and $1,400,000 - State of Michigan and $1,356,000 from industry in 1999. A total of $34,263,500 has been provided to support this work by non-federal sources.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted on the campus of Michigan State University and at the Michigan Biotechnology Institute International. Demonstrations of technology occur throughout the United States.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Consortium reports specific milestones for technology development over a five year period. Specific milestones for technologies which will be commercialized in fiscal year 1999 were established in fiscal year 1995 and updated annually. The Consortium has been successful in effectively closing the gap between research and commercialization in the five-year period.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Michigan Biotechnology Institute was evaluated for scientific merit by an agency peer review panel on February 25, 1999. The panel recommended approval of the project pending receipt of supplemental information on administrative aspects of the project. A merit review panel will be convened to re-evaluate of the project upon receipt of a proposal for fiscal year 2000.

MIDWEST ADVANCED FOOD MANUFACTURING ALLIANCE, NEBRASKA

Mr. Skeen. Please provide a description of the research that has been funded under the Midwest Advanced Food Manufacturing Alliance grant.

Response. The stated purpose of the Midwest Advanced Food Manufacturing Alliance is to expedite the development of new manufacturing and processing

technologies for food and related products derived from United States produced crops and livestock. The Alliance involves research scientists in food science and technology, food engineering, nutrition, microbiology, computer science, and other relevant areas from 12 leading Midwestern universities and private sector researchers from numerous U.S. food processing companies. Specific research projects are awarded on a competitive basis to university scientists with matching funds from non-federal sources for research involving the processing, packaging, storage, and transportation of food products. Projects selected for funding are merit reviewed by non-participating university scientists, industry scientists and scientists from professional organizations. Close cooperation between corporate and university researchers assure that the latest scientific advances are applied to the most relevant problems and that solutions are efficiently transferred and used by the private sector.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this project?

Response. The principal researcher believes the food manufacturing industry is the number one manufacturing industry in the Midwestern region and that opportunities for trade in high value processed food products will grow exponentially on a worldwide basis. The Alliance is positioned to fill the void in longer range research and development for the food industry. Though the focus is regional, it is anticipated that impacts may also be local and national.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal, as stated previously, was to expedite the development of new manufacturing and processing technologies for food and related products derived from United States produced crops and livestock. This is accomplished by conducting a research proposal competition among faculty from the 12 participating universities to fund research projects where matching funds are available from industry. Fourteen projects were funded from fiscal year 1994 funds with completion and final reports due by May 1, 1996. Ten projects were funded from fiscal year 1995 funds with anticipated completion and final reports due by August 31, 1997. Ten projects were also funded from fiscal year 1996 funds with anticipated completion and final reports due by May 31, 1998. Eleven projects were funded from fiscal year 1997 funds with anticipated completion and final reports due by May 31, 1999. Nine projects were funded from fiscal year 1998 funds with anticipated completion and final reports due by May 31, 2000. Eleven projects were funded from fiscal year 1999 funds with anticipated completion and final reports due by May 31, 2001. Proposals are reviewed for scientific merit by independent scientists, and final selection of projects includes consideration of industrial interest and commitment on non-Federal matching funds.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994. The appropriation for fiscal year 1994 was $470,000, and for fiscal years 1995-2000,

$423,000 each year. A total of $3,008,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. Industry matching funds were $823,148 in fiscal year 1994, $414,164 in fiscal year 1995, $576,600 in fiscal year 1996, $429,579 in fiscal year 1997, $557,549 in fiscal year 1998, and $490,496 in fiscal year 1999.

Mr. Skeen. Where is this work being carried out?

Response. The work is being coordinated by the Nebraska Agricultural Experiment Station at Lincoln. Specific research projects are also being conducted at 8 other universities that are part of the Alliance.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The overall objectives of the Alliance are ongoing. Funding supports the continuing and evolving needs and opportunities for foods manufactured and processed from U.S. produced crops and livestock.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. A review of the proposal was conducted on February 24, 1999. The principal investigator has provided descriptions of projects funded by this grant. Scientifically sound, industry-relevant projects appear to be the basis of the project, with impact results expected.

MIDWEST AGRICULTURAL PRODUCTS, IOWA

Mr. Skeen. Please provide a description of the research that has been done under the Midwest Agricultural Products program.

Response. The Midwest Agribusiness Trade Research and Information Center does applied research to improve the global competitiveness and marketability of agricultural products produced in the Midwest and disseminates the results to small and medium-sized agribusinesses. Projects include analyses of potential international markets for U.S. agricultural products and equipment/technology; attitudes of foreign consumers; development of new/improved U.S. products to meet foreign needs. The overall project proposal was peer reviewed at the university level, and individual research activities are reviewed by the principal investigator and other faculty.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes that agribusiness firms in the United States, especially small to medium-sized firms, have a large unrealized potential to expand export sales and foreign business ventures. These untapped opportunities exist in the Pacific Rim and in emerging markets such as Mexico, China, and Eastern Europe. The reluctance of small to medium-sized firms to explore these market opportunities is, in part, due to the high cost of market information and analysis and the perceived high risk of doing business in new markets. This project meets the needs of these firms at the local, regional, and national level.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. The goal is to enhance the exports of agricultural commodities, value-added products, and equipment produced by Midwestern agribusiness firms by providing research and educational programs as well as assistance to individual firms. Recent results include studies on improving the U.S. position in world soybean trade; global competitiveness of U.S. pork subsector; challenges and responses for marketing in large developing Asian countries such as China and India. The soybean study focused on the ability of U.S. firms to provide quality products designed for specific international market uses. Analyses of international markets include Hungary and the Baltic states. Several market development studies, conducted in cooperation with overseas firms, have resulted in ongoing relationships with U.S. firms; an Iowa firm is negotiating a sale of feed processing equipment; another Iowa firm has formed a joint venture in ovine genetics. The primary audience is small- to medium-sized agribusiness firms because they often lack the resources to conduct studies or acquire sufficient marketing information necessary for international trade.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1992. The appropriation for fiscal years 1992-1993 was $700,000 per year; fiscal year 1994, $658,000; and fiscal years 1995-2000, $592,000 per year. A total of $5,610,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $185,495 State appropriations and $373,897 industry for a total of $559,392 in 1992; $183,192 State appropriations and $318,966 industry for a total of $502,158 in 1993; $127,948 State appropriations and $500,394 industry for a total of $628,342 in 1994; $258,053 State appropriations and $389,834 industry for a total of $647,887 for 1995; $165,425 State appropriations for 1996; $162,883 State appropriations for 1997; and $143,850 State appropriations and $51,384 industry for a total of $195,234 in 1998. $72,934 State appropriations and $45,860 industry for a total of $118,794 in 1999. Industry contributions were not reported for 1996-1997.

Mr. Skeen. Where is the work being carried out?

Response. The program is carried out by Iowa State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1992 was for a period of 24 months, however, the objective of expanding the export capacity of small to medium-sized agribusiness firms is an ongoing regional and national concern. The current phase of the program will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in January 1998, as it evaluated the project proposal for 1999, and concluded that "the project has sound objectives and procedures that are helping agribusiness effectively expand markets for U.S. agricultural products leading to a highly competitive agricultural production system and enhanced economic opportunity for Americans." Research results appear in several peer-reviewed professional journals and the popular press.

MILK SAFETY, PENNSYLVANIA

Mr. Skeen. Please provide a description of the research that has been funded under the milk safety grant.

Response. The overall goal of the milk safety program is to provide insight into factors that help ensure an adequate and safe milk supply. The research has focused on factors that affect milk production, processing, manufacturing, and consumption; including computer models for risk assessment. Special attention has been given to ways of preventing and/or treating pathogens that enter the milk supply.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that the question of microbial safety is of paramount interest to the milk/dairy industry at all levels -- national, regional and local. Dairy products have been associated with several large outbreaks of staphylococcal food poisoning. Coagulase negative *Staphylococcus, Listeria monocytogenes* and pathogenic *E. coli* species, including *E. coli* O157:H7, are of public health concern. The population of infants, elderly, and immunosuppressed individuals at highest risk in the U.S. continues to grow rapidly. Understanding the growth of these microorganisms will provide pathways to minimize the occurrence of food poisoning related to milk and dairy products. For products which receive minimal thermal processing or which may be preserved primarily by acidification, development of additional means of controlling the growth of these foodborne pathogens is of critical importance in

guaranteeing a safe milk supply. Ensuring the safety of dairy products impacts not only consumer health and confidence in the safety of the food supply, but economic viability as well.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The research is aimed at minimizing or eliminating future foodborne disease outbreaks from milk and dairy products. Researchers demonstrated that when subjected to a sublethal heat shock prior to pasteurization, *Listeria monocytogenes* becomes much more heat-resistant than previously thought, likely requiring the design of new pasteurization guidelines to ensure the safety of dairy products. They also developed a simple, fast, sensitive, specific and inexpensive method for the detection of *Listeria monocytogenes* in dairy products that will allow dairy processors to rapidly and easily screen for the presence of this pathogen in their products and in the processing environment. A computer model of *Listeria monocytogenes* growth in dairy foods under dynamic refrigeration conditions and during extended storage has been developed and partially validated. This will equip producers and processors with a powerful tool for further enhancing the safety of fluid milk and dairy product. Discoveries of factors influencing growth of *Staphylococcus aureus* could be used to prevent or contain growth of this pathogen in foods. Researchers have identified and sequenced a gene from this bacterium that is essential for growth under stressful conditions. Consumer research has identified characteristics of consumers most likely to have a high general concern about milk and dairy product safety and nutrition. In addition, consumers indicate more trust in farmers' efforts to ensure food safety than in the efforts of other segments of the food system. Research has also indicated that consumers are concerned about food safety, but do not know a great deal about such important hazards as Salmonella, E. coli, and Listeria. Researchers have examined the effects of water availability on the production of enterotoxins by S. aureus and found that the presence of certain nutrients within the environment, or food product, can greatly stimulate enterotoxin production when water availability is low. These results have important implications concerning the safety of certain food products, including those containing dairy ingredients.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded for milk consumption and milk safety from funds appropriated as follows: fiscal years 1986 through 1989, $285,000 per year; fiscal year 1990, $281,000; fiscal year 1991, $283,000; fiscal year 1992, $284,000; fiscal year 1993, $184,000; fiscal years 1994-1998, $268,000 per year; fiscal year 1999, $250,000, and fiscal year 2000 $297,500 A total of $4,059,500 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The University estimates that non-federal funds contributed to

this project include the following costs and salaries: $265,000 for fiscal year 1991; $224,700 for fiscal year 1992; $142,600 for fiscal year 1993; $252,168 for fiscal year 1995; and $621,903 for fiscal year 1998; and $460,423 for fiscal year 1999. No data available for fiscal years 1994, 1996, and 1997.

Mr. Skeen. Where is the work being carried out?

Response. The research is being conducted at the Pennsylvania State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The researchers anticipate that research supported by this grant should be concluded in 2000. Continuing and evolving needs related to the safety of milk and dairy products are expected to reveal new related objectives.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. The proposal supporting the fiscal year 1999 appropriation was reviewed on August 12,1999 and the agency science specialist concluded that the projects addressed important issues related to safety of milk and dairy products, were scientifically sound, and that satisfactory progress was being demonstrated using previously awarded grant funds.

MINOR USE ANIMAL DRUGS

Mr. Skeen. Please provide a description of the research that has been funded under the minor use animal drug program grant.

Response. The National Agricultural Program to Approve Animal Drugs for Minor Species and Uses -- NRSP-7 -- was established to obtain the Food and Drug Administration approval of animal drugs intended for use in minor species and for minor uses in major species. The objectives of the program are to identify the animal drug needs for minor species and minor uses in major species; generate and disseminate data for the safe, effective, and legal use of drugs used primarily in therapy or reproductive management of minor animal species; and facilitate the Food and Drug Administration in obtaining approvals for minor uses. Studies are conducted to determine efficacy, target animal safety, human food safety, and environmental safety. The shortage of drugs for minor food animal uses is a concern well recognized by animal producers, veterinarians, animal scientists, and regulators. The funds for the special research grant are divided between the four regional animal drug coordinators and the headquarters at Cornell University for support of the drug approval program. The NRSP-7 funds are being utilized by the State Agricultural Experiment Stations where the regional animal drug coordinators are located as well as by other stations to develop data required for meeting approval requirements. Participants in the

research program consist of the regional coordinators, State Agricultural Experiment Stations, USDA's Agricultural Research Service, schools of veterinary medicine, and the pharmaceutical companies. Research priorities are continually updated through workshops and meetings with producer groups representing species categories such as small ruminants, game birds, fur-bearing animals, and aquaculture species. Each request for drug approval is evaluated by the technical committee according to established criteria which include significance to the animal industry, cost of developing the necessary data, availability of a pharmaceutical sponsor, and food safety implications. All grants are reviewed for relevance to industry needs and undergo scientific peer review.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Animal agriculture throughout the United States has relied on chemical and pharmaceutical companies to provide their industry safe and efficacious drugs to combat diseases and parasites. The high cost incurred to obtain data to approve these drugs, when coupled with limited economic returns, has limited the availability of approved drugs for minor uses and minor species. The economic losses due to the unavailability of drugs to producers for minor species and minor uses threatens the economic viability of some segments of the animal industry. The need for approved drugs to control diseases in minor species and for minor uses in major species has increased with intensified production units and consumer demand for residue-free meat and animal products. The program provides research needed to develop and ultimately culminate in drug approval by FDA for the above purposes. The goals are accomplished through the use of regional animal drug coordinators as well as a national coordinator to prioritize the need, secure investigators at federal, state and private institutions, and oversee the research and data compilation necessary to meet federal regulations for approval. All drug approvals are national, although industry use may be regional. For example, certain aquaculture and the game bird industries are concentrated in specific geographic sections of the country. The administration believes this research supports national, regional and local needs.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the NRSP-7 Minor Use Animal Drug Program was to obtain approval by the Food and Drug Administration for animal drugs intended for use in minor species and for minor uses in major species. This continues to remain the dominant goal of the program. In recent years, the research program has expanded or given additional emphasis to aquaculture species, veal calves and sheep. The importance of environmental assessment, residue withdrawals and occupational safety have increasingly been given more attention during the approval process to help assure consumer protection.

Since the beginning of the program, over 300 requests have been received from animal producers, universities and veterinarians for the development of data in support of the filing of a New Animal Drug Approval. Currently, data representing 28 Public Master Files have been published in the Federal. The

Public Master File publication enables pharmaceutical companies to extend their label claims to minor species by referencing the published file in their New Animal Drug Approval filing. Furthermore, these data also enter the public domain as presentations to professional groups, publication of peer-reviewed articles and inclusion in the Food Animal Residue Avoidance Databank. Through these channels, NRSP-7 provides data supporting the safe and effective use of therapeutics in minor species by consumers. Moreover, the Minor Use Animal Drug Program has averaged an expenditure of only about $200,000 for each drug approved for minor species.

In 1999, two Public Master Files, based on data submitted by NRSP-7, were published in the Federal Register indicating drug approval by the Food and Drug Administration. They were: Sulfadimethoxine/ormetoprim for control of coccidiosis in Chukar partridges and amoxicillin for treatment of bacterial pneumonia in sheep. In addition, three Public Master Files were submitted to the Food and Drug Administration by NRSP-7 for review. The three drugs and their use are: oxytetracycline for otolith marking of fish, ceftiofur for bacterial pneumonia in goats, and ivermectin pour-on for hypodemosis in American bison.

In addition to the development of data for Food and Drug Administration review, the NRSP-7 program initiated a species grouping program. Designed to make the drug approval process more efficient for all minor species, research was begun that will enable game birds and fish to be evaluated on the basis of one or two marker species. With species grouping, safety and efficacy studies of a drug in one species could be extrapolated to other species within the same class. Considering that the aquatic and game bird classes contain at present 10 and 8 economically significant production species, respectively, rates of Public Master File publications could be increased many-fold. The Center for Veterinary Medicine of the Food and Drug Administration is cooperating and supporting this program to the fullest extent, thereby demonstrating a prime example of Federal interagency collaboration in coordination with academic institutions, pharmaceutical industries and commodity interests to effectively meet an urgent public health need.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from appropriated funds in the amount of $240,000 per year for fiscal years 1982-85; $229,000 per year for fiscal years 1986-1989; $226,000 for fiscal year 1990; $450,000 for fiscal year 1991; $464,000 per year for fiscal years 1992 and 1993; $611,000 for fiscal year 1994; and $550,000 per year for fiscal years 1995-2000. A total of $7,391,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $156,099 state appropriations, $29,409 industry contributions and $11,365 miscellaneous in 1991; $265,523 state appropriations, $1,182 product

sales, $10,805 industry contributions and $59 miscellaneous in 1992; $212,004 state appropriations, $315 industry contributions and $103 miscellaneous in 1993; $157,690 state appropriations and $7,103 miscellaneous in 1994; $84,359 state appropriations in 1995; $191,835 non-federal support in 1996; $357,099 non-federal support in 1997; $104,596 state appropriations and $97,375 industry contributions in 1998; and $317,225 state appropriations and $9,678 industry contributions, and $7,000 miscellaneous in 1999.

Mr. Skeen. Where is this work being carried out?

Response. The grants have been awarded to the four regional animal drug coordinators located at Cornell University, the University of Florida, Michigan State University and the University of California-Davis, and to program Headquarters at Cornell University. Research is conducted at these universities and through allocation of these funds for specific experiments at the State Agricultural Experiment Stations, the Agricultural Research Service, the US Department of Interior, and in conjunction with several pharmaceutical companies.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. Selected categories of the Special Research Grants program address important national/regional research initiatives. The overall objectives established cooperatively with FDA and industry remain valid. However, specific objectives continually are met and revised to reflect the changing priorities for FDA, industry, and consumers. Research projects for this program have involved 20 different animal and aquaculture species with emphasis given in recent years to research on drugs for the expanding aquaculture industry and increasing number of requests from the sheep, veal calf, and game bird industries. The program involves research on biological systems that by their nature are ever changing and presenting new challenges and/or threats to agriculture.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency conducted a formal review of the Minor Use Animal Drug Program in 1997. An external review team of experts representing animal drug research and development, the veterinary profession, the pharmaceutical industry, and academia, found the program to be very productive. Recommendations from the review included a) improve the visibility of the Minor Use Animal Drug Program, b) improve working relationships with the veterinary and pharmaceutical communities, c) and acquire additional support for the program by pharmaceutical companies, universities, and the federal government to meet the identified national needs with emphasis on responsiveness to industry needs and food and environmental safety. In 1999, stakeholders representing the sheep, aquaculture, goat, and game bird industries met with CSREES administration and NRSP-7 representatives to define research priorities for the

Minor Use Animal Drug Program. Annually, grant proposals are scientifically peer reviewed and twice a year the agency and program representatives meet with the Food and Drug Administration representatives to evaluate progress and to prioritize research requests. Workshops are held periodically to identify priorities for the program whereby producers, pharmaceutical companies, FDA, and researchers participate.

MOLLUSCAN SHELLFISH, OREGON

Mr. Skeen. Please provide a description of the research that has been funded under the Molluscan Shellfish grant.

Response. The agency requested that the university submit a grant proposal that has yet to be received. A molluscan shellfish germplasm repository was established with funds from this grant and has played a key role in the genetic improvement of cultured shellfish stocks on the west coast. With specific shellfish stocks that are being made available to commercial growers, a broodstock selection program is currently underway to determine stocks with traits desirable for commercial culture. Additionally, the repository is used to establish a population of tetraploid pacific oysters for use in the production in triploid oysters and has established a population of Kumamoto oysters.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The researchers indicate that there is a national need for a molluscan broodstock development program. This line of research will benefit the commercial shellfish industries on the west coast and nationally through the conservation of shellfish lines with desirable traits, studies involving genetic manipulation to increase disease resistance and enhance growth, and judicious husbandry practices utilizing molluscan shellfish resources.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals of this research program are to establish a repository for molluscan shellfish germplasm, to establish breeding programs for commercial production of molluscan shellfish, and to establish a resource center for the industry researchers, and other interested parties in the United States and abroad. The oyster broodstock selection program was implemented in partnership with industry and performance trials of selected stocks continue at commercial sites. Tetraploid oysters are being produced for use in the production of triploid seedstock to be used in commercial production trials. A temperature-controlled algae culture facility has been constructed to provide adequate nutrition to the oysters used in the studies. Oyster broodstock conditioning systems have been developed and in 1999, over 120 families were evaluated at commercial sites

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1995 with an appropriation of $250,000; fiscal year 1996 was $300,000; and $400,000 in each of fiscal years 1997 through 2000. A total of $2,150,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates a total of $135,454 of non-federal funding in fiscal year 1995 primarily from state sources; in fiscal years 1996, 1997, 1998, and 1999, no cost sharing was provided.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at Oregon State University.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Specific research objectives outlined in the original proposal were completed in 1996. Researchers have broadened the scope of the project from the original objectives and it is anticipated that these objectives will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The proposal is put though the university's peer review process and is reviewed on an annual basis by the Program Managers, the Program Specialist, and is consistent with United States Department of Agriculture guidelines. The researchers are asked to the develop a research proposal consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development. The university is required to submit an accomplishment report when the new proposal is submitted to the agency for funding. The 1999 review concluded that the researchers were well qualified and work in close cooperation with the private sector. Progress on previous work is well documented and the work complements other research being funded though the United States Department of Agriculture on molluscan shellfish.

MULTI-CROPPING STRATEGIES FOR AQUACULTURE, HAWAII

Mr. Skeen. Please provide a description of the research funded under the Multi-Cropping Strategies for aquaculture research grant in Hawaii.

Response. The agency requested that the university submit a grant proposal that has yet to be received. The original goal of this program was to identify and develop sustainable and commercial opportunities inherent in the Molokai aquaculture community while maintaining the cultural and physical environment unique to Molokai. In fiscal year 1993, the university redirected this research program to address the opportunities of alternative aquaculture production systems, including the ancient Hawaiian fish ponds on the island of Molokai. A

community-based research identification process has been used to identify and develop specific research projects and prioritize objectives in this program. Current research includes work in the area of water quality characterization to accelerate permitting of aquaculture systems. Field testing of alternative species in the ancient Hawaiian fish ponds also continues.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researchers indicate that the primary need for this research is to assist the native Hawaiians in improving the profitability and sustainability of the ancient Hawaiian fish ponds and other appropriate

aquaculture systems as part of a total community development program on the Island of Molokai.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this program was to develop technology for the co-production of shrimp and oysters in aquacultural production systems. Research led to the development of oyster production systems that have been field tested under commercial conditions. The objective of the program is to implement sustainable subsistence and commercial development of Molokai fish ponds while maintaining the culture and physical environment unique to Molokai. Production methods have been developed for native species including Pacific threadfin, Moi, and seaweed and studies involving shrimp and ornamental fish production are underway. Additionally, studies addressing water quality issues necessary for permitting of the ancient Hawaiian fish ponds for aquaculture are being conducted.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. This research was initiated in fiscal year 1987 and $152,000 per year was appropriated in fiscal years 1987 through 1989. The fiscal year 1990-1993 appropriations were $150,000 per year; $141,000 in fiscal year 1994; and $127,000 in fiscal years 1995-2000, each year. A total of $1,959,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university reports a total of $137,286 of non-federal funding for this program in fiscal years 1991-1994, $318,468 in fiscal years 1995-1996, $116,730 in fiscal year 1997, $197,000 in fiscal year 1998, and no non-federal funds are available for this project for fiscal years 1999 and 2000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted through the University of Hawaii on

the island of Molokai.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The completion date for the original project was 1993. The original objectives were met. The specific research outlined in the current proposal will be completed in fiscal year 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The proposal is placed through the university's peer-review process, is reviewed by the Program Managers and Program Specialist on an annual basis, and is consistent with United States Department of Agriculture guidelines. The researchers are asked to the develop a research proposal consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development. The university is required to provide an accomplishment report when the new grant proposal is submitted to the agency for funding. Adequate progress has been reported on specific tasks by agency-funded personnel and activities. The research is relevant and addresses an important opportunity for the aquaculture industry on Molokai.

MULTI-COMMODITY RESEARCH, OREGON

Mr. Skeen. Please provide a description of the research done under the Multi-Commodity Research program?

Response. This research provides agricultural market research and analysis to support Pacific Northwest producers and agribusiness in penetrating new and expanding Pacific Rim markets for value-added products. It examines the potential for increasing the competitiveness of Pacific Northwest agriculture through improvements in food production, processing, and trade by assisting decision makers in developing economic and business strategies. The research proposal was peer reviewed at the university prior to submission to CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Oregon and other Pacific Northwest States produce a wide variety of agricultural commodities and products with export potential to Pacific Rim countries. Research and analysis are necessary to guide agricultural producers and processors in assessing markets, developing market strategies, and creating appropriate value-added products.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research project is to gain better specific understanding of the technical, economic, and social relationships that define

Oregon's value-added agricultural sector, and examine how these factors affect the economic performance of the sector. This project investigates and develops innovations in value-added agriculture to improve the economic performance of the agricultural and food manufacturing sectors in the Pacific Northwest.

Work in progress has resulted in research output in four topic areas: market research, packaging research, sensory research, and food processing industry strategic planning. Output includes development of a World Wide Web site for PNW exports, data bases, survey work, and collaborative research activity with industry and with institute and university researchers in selected Asian countries. Many high quality manuscripts, working papers, journal articles, and graduate theses have been produced.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The research began in fiscal year 1993. The appropriation for fiscal year 1993 was $300,000; fiscal year 1994, $282,000; and fiscal years 1995 through 2000, $364,000 for each year. The total amount appropriated is $2,766,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funding for this grant $177,574 in State appropriations in 1993, and $162,394 in 1994. The project involves the use of Oregon State University administrative personnel, equipment, utilities and facilities that are indirect costs to the project. These costs constitute an Oregon State University contribution to the project that is not allowable as a reimbursable expense. Because the Oregon state appropriations process penalizes the University for reporting nonreimbursed indirect costs, the university has not reported the amount of non-federal funds appropriated for fiscal years 1995-2000.

Mr. Skeen. Where is the work being carried out?

Response. The research is carried out at Oregon State University in Corvallis, and at the Northwest Food Innovation Center in Portland, Oregon.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1993 was for a period of 12 months, however, the goal of enhancing Oregon's value-added agricultural sector in an ongoing regional and national concern. Progress on the original objectives is as follows: baseline data have been accumulated; an economic growth assessment model is being refined; global competitiveness is being assessed for value-added Pacific Northwest agricultural products; targets for performance are being worked out with agricultural industries; and trade teams have been involved in assessing the ability of U.S. based industries to meet the demands for noodle

production for Asian markets. The current phase of the program will be completed in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in January 1999, as it evaluated the 1999 project proposal, and determined that: "This institution has a highly productive history regarding this research. Outputs and accomplishments in 1998 include 4 scientific journal articles and 1 scientific paper presentation; participation in 8 domestic and 2 international professional, scientific and industry meetings; participation on 2 multistate research committees; completion of 2 MS theses and 1 Ph.D. dissertation; and 1 patent application."

NATIONAL BIOLOGICAL IMPACT ASSESSMENT PROGRAM

Mr. Skeen. Please provide a description of the work that has been funded under the National Biological Impact Assessment Program grant.

Response. The National Biological Impact Assessment Program supports the environmentally responsible use of biotechnology products to benefit agriculture and the environment. This grant provides funding for the Information Systems for Biotechnology which is a national resource in agricultural biotechnology information. The Information Systems for Biotechnology provides information to the research community regarding biotechnology regulations and the environmental issues associated with small and large scale releases of genetically modified organisms. It provides searchable databases, documents and resource lists on the internet, a monthly News Report with over 2,200 subscribers, custom software to assist in risk assessment and management, and printed reference materials.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The National Biological Impact Assessment Program provides information on biotechnology not found anywhere else. This program fulfills an important national need to provide scientists easy access to relevant information that will facilitate conducting research that complies with the oversight and regulatory requirements for testing biotechnology products, and foster the safe application of biotechnology to benefit agriculture and the environment. The Information System for Biotechnology was the first on-line system to address the rapidly expanding information needs of the agricultural biotechnology research community and institutional biosafety committees. It continues to be one of the most comprehensive sources of information on this topic.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to facilitate and assess the safe

application of new techniques for the genetic modification of plants, animals and microorganisms to benefit agriculture and the environment. Since its inception in 1989, the Program has developed tools and resources to provide scientists, regulators, teachers, administrators, and the interested public with value-added information in a readily accessible form. It has developed into a sophisticated computer-based information system and internet site that responds to more than 4200 requests per month from over 40 countries. The site carries documents pertaining to regulatory oversight of biotechnology products, policy statements, and risk assessment and risk management information. Searchable databases include records of all environmental releases of genetically engineered organisms conducted under authority of the Department of Agriculture, institutional biosafety committees, state regulatory contacts, biotechnology research centers and companies. A monthly News Report, covering research, regulatory, legal and international issues, is distributed to 1700 e-mail and 500 print subscribers. Biosafety training workshops have been conducted for public and private sector scientists and state regulatory officials. A major recent activity was publication of the proceedings of a risk assessment workshop on Ecological Effects of Pest Resistance Genes in Managed Ecosystems, that was held January 31-February 3, 1999. Over 800 copies have been distributed by request. Also, a guidebook for safely conducting transgenic research in greenhouses titled "Greenhouse Research with Transgenic Plants and Microbes: A Common Sense Guide to Containment" has been published.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $125,000; fiscal year 1990, $123,000; fiscal years 1991-1993, $300,000 per year; fiscal year 1994, $282,000; and fiscal years 1995-2000, $254,000 per year. A total of $2,954,000 has been appropriated. There are no other potential sources of funding from other Cooperative State Research, Education, and Extension Service programs.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Virginia Tech contributes administrative and clerical support which amounts to approximately $5000 per year.

Mr. Skeen. Where is this work being carried out?

Response. The grant award is with Virginia Tech. Current partners in the program include the University of Minnesota and the Institute for Biotechnology Information.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Ensuring the environmentally responsible use of agricultural biotechnology products is an ongoing and important task. Opportunities for plant

and animal improvement through biotechnology are expanding as more genes are identified and new methods are developed for introducing specific, beneficial genes into plant and animal populations. As these genetically enhanced crops and livestock are adopted commercially, assuring long term safety and efficacy will be a high national priority.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An external panel of scientists reviewed this program in 1994. The review report was highly complimentary of this project and recommended continuation of the program. Another external review is being planned for the year 2000. The current proposal was peer-reviewed at Virginia Tech prior to submission and was also peer-reviewed by the agency.

NEMATODE RESISTANCE GENETIC ENGINEERING, NEW MEXICO

Mr. Skeen. Please provide a description of the work that has been funded under the Nematode Resistance Genetic Engineering Project grant.

Response. This research is designed to investigate naturally occurring compounds from diverse sources that may confer pesticidal resistance if introduced into agronomic plants. The main target pests are no longer plant parasitic nematodes but include insects as well. The work is using molecular biological techniques to incorporate genes into agronomic plants which will shorten the time frame to produce transgenic plants. This project was not awarded competitively but has undergone peer review at the university level and merit review at CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes that the successful development of these techniques and subsequence transfer of genes with insecticidal and/or pesticidal activity into agronomic plants will provide an environmentally sound system for all plants susceptible to pests. The principal researcher believes that project has the potential for both regional and national application.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to provide an alternative approach for the control of plant parasitic nematodes through the use of molecular biological technologies to transfer pesticide resistance to plants. More recently, a insecticidal protease inhibitor gene has been used in transformed plants. A unique technique utilizing insect intestinal membrane vesicles were used as tools for detection of specific protein binding domains. The synthetic gene, CRY3A Bt has been successful for four years in field trails with transformed potato in managing Colorado potato beetles.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 and the appropriations for fiscal years 1990-1993 were $150,000 per year; $141,000 was appropriated in 1994; and $127,000 in fiscal years 1995-2000, each year. A total of $1,353,000 has been appropriated thus far.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $65,000 state appropriations in 1991; $62,000 in state appropriations in 1992; $75,000 in state appropriations in 1994; and $75,000 state appropriations in 1995. For 1996, the University and the Plant Genetic Engineering Laboratory are providing matching contributions in faculty and staff salaries, facilities, equipment maintenance and replacement, and administrative support. In 1997, there were no matching non-federal funds. In 1998 and 1999, state appropriated funds were $48,000 and $71,000, respectively. In 2000, the non-federal funds are $70,000.

Mr. Skeen. Where is the work being carried out?

Response. Research is being conducted at the New Mexico State University, and at collaborating universities in the region.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives have not as yet been met. The estimated completion date for this project is in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last evaluation of this project was a merit review conducted in January, 1999. In summary, the overall goal of this project is to use molecular technology to develop pesticide capability in plants of agronomic importance. A plant transformation system was developed to improve the historically difficult transformation efficiently of monocots. In field trails of transformed eggplants and potatoes, high levels of effectiveness against insects have been found. Other constructs are being used in many crops to determine resistance to nematodes and other crop pests.

NEVADA ARID RANGELANDS INITIATIVE, NEVADA

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. The Cooperative State Research, Education, and Extension Service

has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to develop management systems to protect Nevada's arid range land from invasive weeds and wildfires.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to develop research management and educational programs to promote healthy productive and sustainable use of Nevada rangeland.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $255,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new project. No non-federal funds have been provided at this time.

Mr. Skeen. Where is the work being carried out?

Response. Research will be conducted at the University of Nevada Research Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project is under development, however anticipated completion for the original objectives should be 5 years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project is under development and will be evaluated prior to funding.

NEW CROP OPPORTUNITIES, ALASKA

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. Cooperative State Research, Education, and Extension Service has requested the university to submit a grant proposal that has not yet been received. The research will address the feasibility of growing wild rice as an alternative crop in Alaska.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research addresses a local need to find an alternative crop for the State of Alaska.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This grant is new and the research will build upon existing expertise to offer new opportunities for crop diversification.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $425,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Since this is a new grant, and a proposal has not yet been received, the source and amount of non-federal funds for this research is unknown.

Mr. Skeen. Where is this work being carried out?

Response. This work will be carried at the School of Agriculture and Land Resources management at the University of Alaska, Fairbanks.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met: What is the anticipated date of additional or related objectives?

Response. This project is expected to be completed in three years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the evaluation conducted.

Response. Since this is a new grant, no evaluation has been conducted.

NEW CROP OPPORTUNITIES, KENTUCKY

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received. The research will promote economically sustainable crop production, new crops, and expanded crop uses in Kentucky. Improved plant and innovative production systems through integrated research in plant ecology, biochemistry, physiology and genetics, will be developed. Technology and information support for Kentucky farmers and for the economic base of the state will be provided.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research addresses a regional need to find alternative crops to replace tobacco.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This grant is new and the research will build upon existing expertise to offer new opportunities for crop diversification, technology transfer and demonstrations.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $595,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new grant and no non-federal funds have been provided.

Mr. Skeen. Where is this work being carried out?

Response. This work will be carried at the University of Kentucky and at various locations across the State.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated date of additional or related objectives?

Response. This project is expected to be completed in three years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the evaluation conducted.

Response. This is a new grant and no evaluation has been conducted yet.

NONFOOD AGRICULTURAL PRODUCTS PROGRAM, NEBRASKA

Mr. Skeen. Please provide a description of the research that has been funded

under the Nonfood Agricultural Products Program grant.

Response. This work focuses on the identification of specific market niches that can be filled by products produced from agricultural materials, developing the needed technology to produce the product, and working with the private sector to transfer the technology into commercial practice. Major areas of application include starch-based polymers, use of tallow as diesel fuel, improvements in ethanol production, use of vegetable oil as drip oil for irrigation wells, as a two cycle engine oil, and as a chain saw bar oil, production of levulinic acid, the extraction of wax from grain sorghum and production of microcrystalline cellulose from crop biomass. The Dean and Director of Agricultural Research has initiated a review process that parallels the process used for Experiment Station projects. Two to three faculty member are asked to critically review the proposal using criteria as described by Cooperative State Research, Education and Extension Service in the letter soliciting proposals for 1999.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes our ability to produce agricultural commodities exceeds our needs for food and feed. These commodities are environmentally friendly feedstocks which can be used in the production of many biochemicals and biomaterials that have traditionally been produced from petroleum. The production of the commodities and the value-added processing of these commodities is regional in scope.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The objectives are to identify niche markets for industrial utilization of agricultural products, improve and develop conversion processes as needed for specific product isolation and utilization, provide technical, marketing and business assistance to industries, and coordinate agricultural industrial materials research at the University of Nebraska, Lincoln. Accomplishments include commercialization of soybean based drip oil for irrigation wells. Bruning Grain Co. Marketing "Soy Bio Drip." MCC Technologies, Inc. continues to refine the processing requirement and develop a business plan for production of microcrystalline cellulose from crop residues such as corn cobs, wheat straw and cellulose via a reactive extrusion process developed by the university's Industrial Agricultural Products Center. Various hardness grades of plastic particle media blast using a combination of commercially available biodegradable polymers have been produced. A water resistant starch-based foam has been developed and a patent disclosure has been submitted. A commercialization strategy is being developed. Also, an alternative process for producing biodiesel has been developed and will be disclosed soon. All of these commercialization projects are the result of research efforts, most of which have been supported by the Nonfood Agricultural Products Program. Two Small Business Innovation Research, Phase I, proposals have been funded for technologies developed at the Center. A Phase II proposal is currently being written on loose fill packaging. A Phase II proposal on

levulinic acid is anticipated.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The funding levels for this project are $109,000 in 1990; $110,000 per year in fiscal years 1991-1993; $103,000 in fiscal year 1994; $93,000 in fiscal year 1995; and $64,000 in fiscal years 1996 - 2000 per year. A total of $955,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-Federal funding for this project is: in fiscal year 1992, $315,000; fiscal year 1993, $330,000; fiscal year 1994, $330,000; fiscal year 1995, $309,000; fiscal year 1996, $251,000; fiscal year 1997 $250,000; fiscal year 1998, $340,000; and fiscal year 1999, $260,000 . These funds were from Nebraska Corn, Soybean, Wheat, Sorghum and Beef Boards, World Wildlife Fund, Nebraska Bankers Association, United Soybean Board and National Corn Growers Association, Bioplastics, Inc., Biofoam, Inc. and M.C.C. Technologies, Inc.

Mr. Skeen. Where is this work being carried out?

Response. This work is being conducted at the Industrial Agricultural Products Center, L.W. Chase Hall, University of Nebraska, East Campus, Lincoln, Nebraska.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives of the original projects were completed. Specific objectives have been identified in each renewal request.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project is evaluated based on the annual progress report. The cognizant staff scientist has reviewed the project and determined that the research is conducted in accordance with the mission of this agency.

OIL RESOURCES FROM DESERT PLANTS, NEW MEXICO

Mr. Skeen. Please provide a description of the research that has been done under the Oil Resources from Desert Plants, New Mexico.

Response. The Plant Genetic Engineering Laboratory has been exploring the potential for the production of high value industrial oils from agricultural products. The effort has been focused on transferring the unique oil producing capability of jojoba into oilseed rape and soybean. With the development of technology to both isolate the enzyme components of oil biosynthesis and successfully transform the target plants, significant advances have been made with jojoba. In addition, oil enzymes have been studied in castor, oilseed rape, desert primrose, cyanobacteria, and meadowfoam.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes desert plant sources of valuable oils for industrial applications are typically low yielding and limited in climatic areas for farm production. Genetic engineering offers an opportunity to move genetic capability to high yielding major crops. Many of the oils and their derivative acids, waxes, and others can directly substitute for imports of similar polymer materials, especially petroleum.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research is to transfer the unique oil producing capability of jojoba and other native shrubs into higher yielding crops such as oilseed rape and soybean. This is a form of metabolic engineering and it requires the transfer of coordinated groups of genes and enzymes into the host plant to catalyze the necessary biochemical reactions. Recent progress includes successful transformation of tobacco and alfalfa plants with oil metabolism genes from
the meadowfoam plant and a cyanobacterium.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. This research began in fiscal year 1989 with a $100,000 grant under the Supplemental and Alternative Crops program. Grants have been awarded under the Special Research Grants program as follows: fiscal year 1990, $148,000; fiscal years 1991-1993, $200,000 per year; fiscal year 1994, $188,000; fiscal years 1995-1996, $169,000 each year; and fiscal years 1997 through 2000, $175,000 per year. A total of $2,074,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Matching funds from State and private sources used to help fund this project were $27,747 in fiscal year 1998 and $71,000 in fiscal year 1999. New Mexico State University and the Plant Genetic Engineering Laboratory also provide $90,000 for in-kind support per year including faculty salaries, graduate student stipends, facilities, equipment maintenance, and administrative support services.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted by the Plant Genetic Engineering Laboratory at New Mexico State University, Las Cruces, New Mexico.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. An estimate of the total time required to complete all phases of the project is 3-4 years. The application of this research for improved management of natural resources will evolve and expand as technology in the area advances.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Oil Resources from Desert Plants, New Mexico project was evaluated for scientific merit by an agency peer review panel on February 25, 1999. The panel recommended approval of the project pending receipt of supplemental information on administrative aspects of the project. The Institution conducts an internal peer review of this project by scientists with expertise in this area of research. A panel of scientists will be convened to re-evaluate the project upon receipt of a proposal for fiscal year 2000.

ORGANIC WASTE UTILIZATION, NEW MEXICO

Mr. Skeen. Please provide a description of the research that has been funded under the Organic Waste Utilization, New Mexico grant.

Response. Composted dairy waste is utilized as a pretreatment to land application. Composting dairy waste before land application may alleviate many of the potential problems associated with dairy waste use in agronomic production systems. Composting may also add value to the dairy waste as a potential landscape or potting medium. High temperatures maintained in the composting process may be sufficient for killing enteric pathogens and weed seeds in dairy waste. Noxious odors and water content may be reduced via composting. Composted dairy waste may be easier to apply, produce better seed beds, and not increase soil salinity as much as uncomposted dairy waste. Changes in the physical structure of the soil are being monitored for the effects of composted vs uncomposted amendments. This project undergoes annual peer review from academic institutions and experts from government and state agencies, and industrial partners.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the research will address the utilization of dairy waste combined with other high-carbon waste from agriculture and industry, including potash and paper waste, for composting. This approach to waste management will have high impact for states where dairy and agriculture are important industry sectors. This is especially true for New Mexico and the southwest United States where the dairy business is growing rapidly. This research will also provide an additional pollution prevention tool for the industrial sectors dealing with potash and paper waste. The principal investigator believes this research to be of local, regional and national importance.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research was and continues to determine the feasibility of simultaneously composting dairy waste from agriculture and industry. The research will determine effects of utilizing composted waste, as opposed to raw waste, as a soil amendment on plant growth, irrigation requirements, and nutrient and heavy metal uptake. Phase I, to determine the feasibility of simultaneous composting dairy waste with available high carbon wastes from agriculture and industry, has been completed. Phase II, to determine the appropriate ratios of waste to carbon substrate for successful composting is completed. Phase III, to determine the kinetics of nutrient release and effects of composted material on heavy metal uptake will be completed next year. The study of the second and third year application of the compost will be undertaken this year. This will identify the long term soil impact resulting from compost application.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1996 and the appropriation for fiscal year 1996 was $150,000, and for fiscal years 1997 through 2000, $100,000 per year. A total of $550,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds for the duration of this grant from the state appropriation is $75,000. There is another $50,000 in-kind support from the industrial partners. Additionally, a sum of $15,000 from the New Mexico State Highway Department has been leveraged by this project.

Mr. Skeen. Where is this work being carried out?

Response. This work is being carried out in New Mexico under the direction of the Waste-Management Education and Research Consortium in collaboration with The Composting Council and industrial partners, such as Envio in Ohio, Plains Electric, and McKinley Paper in New Mexico.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Completion date of the initial phases I and II was March 2000 and the project has progressed according to the specified targets. Phase III is ongoing and will be completed by early 2001. Phase IV was added last year to evaluate the multi-year compost application on parameters such as plant growth, soil water retention and soil salinity.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project has been evaluated based on the semi-annual progress report and research findings presented at conferences. The cognizant staff scientist has reviewed the project and determined that this research is conducted in accordance with the mission of this agency.

PASTURE & FORAGE RESEARCH, UTAH

Mr. Skeen. Please provide a description of the research that has been funded under the Pasture and Forage Research, Utah grant.

Response. This is a multidisciplinary effort to develop profitable and sustainable pasture and forage management systems. The Cooperative State Research, Education, and Extension Service requested Utah State University to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The proposed research under this Special Research Grant will address issues related to forage production and utilization in Utah.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this project is to develop a comprehensive guide for the management of irrigated pastures to assist livestock producers reduce cost and increase net returns.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997 and the appropriation for fiscal year 1997 was $200,000, and for fiscal years 1998 through 2000 was $225,000 per year. A total of $875,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds in support of this project and related activities were $360,200 for 1997, $356,000 for 1998 and $364,000 for 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the Utah Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigators anticipate the completion date for these objectives to be in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The grant is peer reviewed annually through the institutions project approval process as well as by the agency National Program Leader and the last on-site review took place in November 1999. The evaluation summary noted that the program, as implemented at the farm level, has already produced significant results in addressing problems of 4-H in Utah and the surrounding area.

PEACH TREE SHORT LIFE IN SOUTH CAROLINA, SOUTH CAROLINA

Mr. Skeen. Please provide a description of the research that has been funded under the Peach Tree Short Life in South Carolina grant.

Response. Progress continued in 1999 with focus on the evaluation and longevity and productivity of Guardian rootstocks on peach tree short life sites in the southeast and replant sites throughout North America. More fundamental work has involved the biochemical characterization of the egg-kill factor produced by a bacteria on nematode eggs. Other basic studies involved the cloning of genes associated with production and expression of toxins from bacteria. New studies were initiated on the use of solarization to reduce nematode populations for peach tree replant. This project was not awarded competitively but has undergone peer review at the university level and merit review at CSREES.

Mr. Skeen. According to the research proposal , or the principal researcher, what is the national, regional, or local need for this research?

Response. According to the principal researcher the problem of disease on peach, nectarine, and plum trees in the southeastern United States effects is very great. More than 70% of peach acreage in the southeast is affected. Research continued on the improvement of rootstocks and the use of the cultivar Guardian BY520-9 which has now been released in 22 states including California, New Jersey and Michigan where bacterial canker is a problem.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date.

Response. The goal of this research was the continued evaluation of productivity of peach Guardian BY520-9 rootstocks on peach tree short life and investigations into novel management for ring nematodes by bacteria. Recent accomplishments include the increase in bulk commercial production of Guardian seed while two new Guardian selections have had very good nursery trails. Guardian rootstock continues to be tested in 22 states and is performing well. A marker for a gene for rootstock resistance to two root-knot nematode species was sequenced and successfully used to correctly sort current commercial rootstocks according to their known nematode resistance or susceptibility. A major find is that the egg-kill factor produced by the bacteria kills root-knot nematode eggs as well as ring nematode eggs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1981, $100,000; fiscal years 1982-1985, $192,000 per year; fiscal years 1986-1988, $183,000 per year; fiscal year 1989, $192,000; fiscal year 1990, $190,000; fiscal years 1991-1993, $192,00 per year; fiscal year 1994, $180,000; fiscal years 1995-2000, $162,000 per year. A total of $3,527,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources for this grant were as follows: $149,281 state appropriations in 1991; $153,276 state appropriations in 1992; $149,918 state appropriations in 1993; $211,090 state appropriations in 1994; $193,976 in state appropriations in 1995; $169,806 in state appropriations in 1996 and 1997; $150,693 in state appropriations in 1998; $92,099 in 1999; and $92,099 in state appropriations in 2000.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at South Carolina Agricultural Experiment Station.

Mr. Skeen. What as the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The researchers anticipate that the work may be completed in fiscal year 2001. Adequate progress has been made to assure that the objectives will be met before the completion date.

Mr. Skeen. What was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last agency evaluation of this project was a merit review completed in January, 1999. In summary, the evaluation of peach rootstocks with resistance to peach tree short life is of continued importance in managing this disease. The use of biological control strategies in suppression of plant parasitic nematodes are a complementary area of research in that it can enhance disease management by protecting the peach rootstocks. Solarization of orchard sites prior to peach tree replanting significantly altered the microbial community and suppressed nematode multiplication in the rhizosphere. Some accomplishments were the increased production and release of commercial Guardian seed and continued evaluation of rootstock in 22 states and provinces. A molecular techniques that separates resistant and susceptible peach rootstocks was validated.

PEANUT ALLERGY REDUCTION, ALABAMA

Mr. Skeen. Please provide a description of the research that has been funded under the Peanut Allergy Reduction, grant.

Respondent. The industry, in conjunction with Alabama A&M University, Auburn University and the University of Georgia are trying to develop a response to the problem of peanut allergy being experienced by greater numbers of people and have determined that research is needed in the following areas: 1) the possibility of reducing the allergenic potential of peanuts through bioengineering and traditional breeding targeted at modifying the peanut proteins responsible for causing allergic reactions; 2) development of vaccines and other means to desensitize people with peanut allergies; and 3) development of better marketing, handling and processing methods to reduce allergy risks.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Respondent. Peanut allergies present a major problem for the growth of the peanut industry nationally, regionally and locally.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Respondent. The original goals of this research are to 1) reduce the allergenic potential of peanuts through bioengineering and traditional breeding targeted at modifying the peanut proteins responsible for causing allergic reactions; 2) develop vaccines and other means to desensitize people with peanut allergies; and 3) develop better marketing, handling and processing methods to reduce allergy risks.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Respondent. The work supported by this grant begins during this fiscal year 2000. The appropriation for fiscal year 2000 is $425,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Respondent. A grant proposal is expected from a consortium of universities, among them are Alabama A&M University, Auburn University, and the University of Georgia. Since grant proposals have not yet been received, the source and amount of non-federal funds for this research is not known.

Mr. Skeen. Where is this work being carried out?

Respondent. The research is expected to be carried out in Alabama.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Respondent. Since grant proposals from the cooperating universities of the consortium have not yet been received, the anticipated completion date and completion of objectives is not yet known.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Respondent. Since grant proposals from the cooperating universities of the consortium have not yet been received, the date of the last agency evaluation is not yet known.

PEST CONTROL ALTERNATIVES, SOUTH CAROLINA

Mr. Skeen. Please provide a description of the research that has been funded under the Pest Control Alternatives grant.

Response. This grant supports research and technology transfer to provide growers with alternatives for managing pests and to implement the use of new alternatives reducing the sole reliance on chemical pesticides.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The investigators contributing to the research and technology transfer at South Carolina believe that need for the development of alternatives for managing pests on vegetables is a regional and national problem. Contributions from the South Carolina work are projected by South Carolina to impact vegetable production in the Southern region and consumers of vegetable production from the Southern region.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. Studies conducted during 1999 demonstrated that *Bacillus thuringiensis* formulations and combinations with botanicals such as neem controlled a number of insect pests important on collards. Comparisons were conducted with commonly used conventional pesticides. Clearly, microbial

products or microbial materials in combination with botanicals such as neem, can control caterpillars on leafy greens without the use of broad spectrum chemical insecticides. Fresh cowpea pods were treated with different concentrations of neem to determine the effects on the southern green stinkbug. Numbers of feeding punctures were significantly reduced when pods were treated with neem. Also, treatment caused deformed adults that could not feed or reproduce. Because neem is "soft" on beneficial insects and spiders, it may be considered as a part of an ecologically-compatible program of insect control in several vegetable crops.

Field studies conducted during 1999 have shown that applications of the entomopathogenic nematode, *Steinernema fletiae*, are as effective in reducing damage from the squash vine borer as standard insecticide sprays. Foliage sprays of a Bacillus thuringiensis formulation were also effective in reducing damage by this pest.

Plant-feeding insects and predators were monitored by two different methods in 5 species of medicinal plants during the spring and summer of 1999. Except for one small, localized outbreak of whiteffies, the natural enemies kept potential posts in check, Major predators included ladybeetles, *Nabis sp., Geocoris spp.*, and spiders in the genus *Pardosa*. These preliminary results show that any insect management program on medicinal herbs should avoid altogether the use of chemical insecticides. Seedless watermelon were more resistant to powdery mildew than seeded ones. Losses to powdery mildew should be less with seedless than with seeded varieties. 'Munchkin' and 'Baby Boo' mini-pumpkins were the most productive varieties among 11 mini-pumpkins tested. Collards produced by crossing collard and cabbage germplasm had increased vigor and favorable color, size and shape for the fresh market. South Carolina county extension agents were provided technology transfer information by Clemson University research scientists participating in this research. Topics included, 1) conservation of indigenous natural enemies, 2) augmentation of predators and parasitoids, 3) age of microbial agents in cultivated systems and 4) nematodes as biocontrol agents. County agents should be more informed about the practical use of biological control agents as alternatives to chemical insecticides.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1992 and the appropriation for fiscal years 1992 and 1993 was $125,000 per year. In fiscal year 1994 the appropriation was $118,000 and in fiscal years 1995 through 2000, $106,000. A total of $1,004,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. South Carolina has provided approximately $200,000 in personnel support and operating dollars per year from State appropriations based on the PI's estimate.

Mr. Skeen. Where is the work being carried out?

Response. This research and technology transfer program is being conducted at the South Carolina Agricultural Experiment Station, Clemson University at Clemson, Florence, and Charleston, South Carolina.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives of the project were for five years. The project was revised in 1998. Research on objective A: to develop and evaluate microbial pest control agents for control of plant pathogens and insect pests of vegetables, is diffuse and non-conclusive. It would be far superior for continued work in this area to be submitted to competitive peer review programs where the investigators would need to clearly focus specific activities and receive the benefit of the comments of peer scientists. Objective B: to determine the efficacy of innovative cultural practices for vegetable production systems in South Carolina and Objective C: to assess the role of indigenous predators, parasites, and pathogens in controlling insect pests; determine environmental and biological factors that influence the abundance and distribution of these indigenous beneficials; and consider the presence of natural enemies, as well as pests, in management decisions. These are areas where the most progress appears evident and has been cited in the accomplishments. The base of information and orientation of the research in these areas is adequate and of such quality that the investigators could compete well in competitive grant programs such as sustainable agriculture or regional Integrated Pest Management grant programs, and would benefit from the peer review process. Progress in these areas is an ongoing process as explanations are sought for the results being obtained. Objective D: to evaluate and develop germplasm, breeding lines and cultivars for resistance to major pathogens of commercially important vegetables and Objective E: to transfer new technology to user groups, have not at this time, demonstrated progress which could be anticipated from ongoing conventional sources of funds.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project is evaluated annually when the grant is processed. An agency evaluation of this project is to be scheduled for the last part of fiscal year 2000.

PEST MANAGEMENT ALTERNATIVES

Mr. Skeen. Please provide a description of the research that has been funded under the Pest Management Alternatives special grant.

Response. This special research grant supports projects that help farmers respond to the environmental and regulatory issues confronting agriculture. These special grant funds support research that provides farmers with replacement technologies for pesticides that are under consideration for regulatory action by EPA and for which producers do not have effective alternatives. The passage of the Food Quality Protection Act of 1996 (FQPA) makes this special research grant of critical importance to the Nation's farmers.

New pest management tools are being developed to address critical pest problems identified by farmers and others in a crop production region, and to identify new approaches to managing pests without some of the most widely used pesticides. Farmers have identified the lack of effective alternative pest management tactics as a primary reason for not implementing IPM on their farms. Where effective alternative tactics have been developed, they are widely and rapidly implemented by farmers. These special research grant funds are distributed on a competitive basis to all eligible research institutions through the Pest Management Alternatives Program or PMAP. Research priorities

for PMAP are established with the help of a database analysis system, which draws upon the expertise of the land-grant university system, commodity groups, and others.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research.

Response. The ability of the Nation's agricultural production system to keep pace with domestic and global demand for food and fiber is dependant on access to safe, profitable and reliable pest management systems. For a variety of factors, farmers and other pest managers have fewer chemical control options available to them than they did at the beginning of the decade, and this trend is likely to continue at an accelerated rate. The Food Quality Protection Act of 1996 (FQPA) will have significant impacts on pest management systems in the United States over the next decade, and the "minor use" (high value crops grown on relatively few acres) will be particularly hard hit. For these reasons and others, it is essential that farmers be provided with new pest management tools and better information so they can remain competitive in today's global marketplace.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This research is conducted to help farmers respond to the environmental and regulatory issues confronting agriculture by providing them with new options for managing pests. The research supported by this special grant is identifying new ways to manage pests without key pesticides that may no longer be available as FQPA is implemented. Some highlights of the research funded through PMAP include technology that reduces organophosphates in apples, modified cropping systems that replace herbicide use in pumpkins and squash, surface amendments that reduce aerial pesticide pollutants, development of pest and natural enemy thresholds to improve pest scouting on wheat, models to improve pesticide use efficiencies in minor fruit crops, improved insecticide and herbicide spray technology, new selective insecticides to control broccoli insects, and use of non-traditional oil sprays to control mites on apples.

Mr. Skeen. How long has this work been underway and how much as been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal years 1996 through 2000, $1,623,000 each year. A total of $8,115,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds are not required by this grants program.

Mr. Skeen. Where is the work being carried out?

Response. All State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals are eligible to compete for this funding. This research is currently being carried out by State Agricultural Experiment Stations and other research organizations located in 20 States.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The economic and environmental pressures facing U.S. agriculture today are greater today than in 1996 when federal funds were first appropriated for this special research grant. There will be a need for continued investment in research to develop new approaches to managing pests for the foreseeable future as the Food Quality Protection Act of 1996 is implemented.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Each new draft RFP and all project proposals are evaluated annually by multi-disciplinary relevancy and merit review panels. A joint USDA/EPA workshop to evaluate the progress and scope of the program was held in Arlington, VA on May 11th, 1999. The conclusions were that the program was on course and making good progress, and could do more with additional funding. The projects supported by this special research grant have consistently provided key knowledge needed in developing new approaches to pest management. The focus on pesticides targeted by FQPA assures that critical pest management alternatives are being addressed. PMAP has supported 82 projects in 29 States since it started five years ago.

PHYTOPHTHORA ROOT ROT, NEW MEXICO

Mr. Skeen. Please provide a description of the research that has been funded under the Phytophthora Root Rot grant.

Response. Work has continued to focus in general on the development of strategies for sustainable vegetable production in irrigated lands. This research includes continued work on the search for *Phytophthora* root rot resistance in chilies, identification of molecular markers for rot tolerant genes, investigation on irrigation modification as a means to manage root rot, and soil bed temperature control as a means to manage disease.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes that since *Phytophthora* disease threatens chili production in west Texas, New Mexico, and Eastern Arizona, this problem is of state- and regional significance.

Mr. Skeen. What is the original goal of this research and what has been accomplished to date?

Response. The original goal was to improve chile production through genetically superior cultivars, combined with new improved cultural practices. Researchers have developed a highly effective disease screen that selects resistant seedlings, found that genes for resistance to root rot do not provide protection against *Phytophthora* foliar blight, that a wild species of *Capsicum* is immune to the fungus, and that molecular markers are useful to introgress genes for tolerance.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 with an appropriation of $125,000 for that year. The fiscal years 1992-1993 appropriation was $150,000 per year; $141,000 in fiscal year 1994; and $127,000 in fiscal years 1995-2000, each year. A total of $1,328,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds from state appropriations and the California Pepper Commission were $255,614, in 1997; $253,614 in 1998; and state appropriations in 2000 are $250,000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at New Mexico State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives was 1995. These objectives have not been met. Related programs deal with research and development efforts designed to prevent or manage diseases impacting vegetable production in irrigated areas, and cooperators estimate that the objectives of these programs should be met by 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last merit review was made in January, 1999. In summary, the development of resistant cultivars and research on interactions of *Capsicum* and *Phytophthora* for developing strategies for irrigated crop growers to be competitive in the international economic arena continued. More than 40,000 seedlings were screened for resistance to root rot and/or foliar blight in the greenhouse. Several individual plants from cayenne, jalapeno, and new Mexican pod types were found to possess both root-rot and foliar blight resistance. Unfortunately due to an introduction of curly top virus the field evaluation were lost this year. However, other research continues to identify molecular makers linked to foliar blight.

PLANT, DROUGHT, AND DISEASE RESISTANCE GENE CATALOGING

Mr. Skeen. Please provide a description of the research that has been funded under the Plant, Drought, and Disease Resistance Gene Cataloging grant.

Response. This research grant identifies, characterizes, and catalogs genes that enhance the ability of agricultural crops to resist stress caused by drought and disease organisms. The project constructs, carts, and distributes Cana libraries for genes that are differentially expressed in response to drought or disease pressure. Work is also being done to sequence DNA of these genes, to characterize their patterns of expression, and to develop databases to share information with other scientists.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research will improve the drought and disease resistance of agricultural crops in New Mexico and throughout the United States. This work

has applications throughout the Nation, especially in the arid and semi-arid production regions.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This research project was supported so that better adapted agricultural crops could be developed for difficult environments in New Mexico and throughout the United States. New Mexico State University established the facility, developed a database to catalogue Cana, and began the initial work of sequencing and cataloging genes into biologically informative groups. To date, scientists have isolated the appropriate DNA to construct libraries of drought-stress induced transcripts from three different chile genotypes, one grass, and one clover. Additionally, they have selected the germplasm to characterize for other species.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 and has been with appropriations of the following amounts: fiscal years 1998 and 1999, $150,000 per year; fiscal year 2000, $212,500. A total of $512,500 has been appropriated since fiscal year 1998.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. In fiscal year 1998, New Mexico Agricultural Experiment Station provided $8,444 in non-federal funds. The funds covered a portion of the salary for the two principal investigators.

Mr. Skeen. Where is this work being carried out?

Response. The research is primarily conducted at New Mexico State University. Collaborations with Los Alamos National Lab and the National Center for Genome Resources have been established.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. When it was initiated in fiscal year 1998, this project was designed to demonstrate significant accomplishments within a five-year time frame. The principal investigators report significant progress has been made in achieving project objectives.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last agency evaluation of this project was an agency merit review which took place last March, 2000. This evaluation noted that the faculty at New Mexico State University have been conducting research on genes involved in disease and drought resistance on a wide range of crops and have recently developed expertise and collaborative efforts in bio-informatics. Work has begun on two new databases in the areas of plant metabolism and cell biology. When the cDNA libraries are constructed, curated and distributed, scientists from around the world will have access to this database information. It was noted that this project addresses high priority

objectives in plant genetics which are directed to economically important crops and approval of funding was highly recommended.

POTATO RESEARCH

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. Scientists at several of the State Agricultural Experiment Stations are breeding new potato varieties, high yielding, disease and insect resistant potato cultivars, adapted to the growing conditions in their particular areas, both for the fresh market and processing. Research is being conducted in such areas as protoplast regeneration, somoclonal variation, storage, propagation, germplasm preservation, and cultural practices. Congressional language for fiscal years 1997, 1998, 1999, and 2000 has directed CSREES to award these funds on a competitive basis. In each of the years, CSREES published a request for proposals in the Federal Register and awarded grants competitively based on a scientific peer review.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research effort addresses needs of the potato producers and processors throughout the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to improve potato production through genetics and cultural practices as well as improve storage for quality potatoes for processing and fresh market. This research has resulted in a number of new high yielding, good quality, disease and insect resistant cultivars, which are now being used in the processing industry and in the fresh market. Regional comprehensive breeding programs have been developed to produce cultivars targeted to the specific growing conditions of that region. A number of the new cultivars have also been adaptable to other regions. These programs have also had success in identifying resistance to pests and pathogens in wild germplasm and are developing expertise to incorporate genetic engineering approaches as traditional components of the program.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1983, $200,000; fiscal year 1984, $400,000; fiscal year 1985, $600,000; fiscal years 1986-1987, $761,000 per year; fiscal year 1988, $997,000; fiscal year 1989, $1,177,000; fiscal year 1990, $1,310,000; fiscal year 1991, $1,371,000; fiscal years 1992 and 1993, $1,435,000 per year; fiscal year 1994, $1,349,000; fiscal years 1995 through 1998, $1,214,000; and for fiscal years 1999 and 2000, $1,300,000 per year. A total of $19,252,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows:$401,424 state appropriations, $4,897 product sales, $249,830 industry, and $30,092 miscellaneous in 1991; $567,626 state appropriations, $6,182 product sales, $334,478 industry, and $44,323 miscellaneous in 1992;

$556,291 state appropriations, $9,341 product sales, $409,541 industry, and $44,859 miscellaneous in 1993; $696,079 state appropriations, $21,467 product sales, $321,214 industry, and $226,363 miscellaneous in 1994; $935,702 state appropriations, $35,376 product sales, $494,891 industry; and $230,080 miscellaneous in 1995; and an estimated $900,000 state appropriations, $10,000 product sales, $400,000 industry, and $200,000 miscellaneous in each of 1996, 1997, 1998, and 1999.

Mr. Skeen. Where is this work being carried out?

Response. The research work is being carried out at the Cornell, Idaho, Maine, Michigan, North Dakota, Oregon, Pennsylvania, Washington, North Carolina, New Jersey, and Colorado State Agricultural Experiment Stations. The grant to Colorado is divided by Colorado with the California and Texas Agricultural Experiment Stations.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated to accomplish significant results in about five years. Because the research is based on genetic varietal development, progress is developing new potato varieties takes from 5 to 10 years.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Beginning in fiscal year 1997, these funds have been awarded on a competitive basis using a scientific peer review. In addition, CSREES conducts a formal meeting with representatives from the potato industry to review research needs and provide input to the agency on the merits of the proposals.

PRECISION AGRICULTURE, KENTUCKY

Mr. Skeen. Please provide a description of the research that has been funded under the Precision Agriculture, Kentucky grant.

Response. The Cooperative State Research, Education and Extension has requested the university to submit a grant proposal that has not yet been received. Research will evaluate site-specific practices for production of corn and soy beans under field conditions. The work will compare various combinations of management practices using site-specific technology and evaluate economics of its application.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to provide objective information about precision agriculture technologies to assist farmers in the development of management systems that are productive, economical, and environmentally benign.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to evaluate site specified technologies and develop recommendations for their use in crop management systems.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999 and the appropriation for fiscal year 1999 was $500,000 and 2000 is $850,000, total of $1,350,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new project which has not yet begun and, therefore, no non-federal funds have been used.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted at the Kentucky Agriculture Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for this project is 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project will be evaluated upon receipt of the required grant proposal.

PRE-HARVEST FOOD SAFETY, KANSAS

Mr. Skeen. Please provide a description of the research that has been conducted under the Pre-Harvest Food Safety, Kansas grant.

Response. Longitudinal studies on the fecal shedding of *Escherichia coli* 0157:H7 (*E. coli* 0157:H7) by cattle on beef cow-calf ranches are being done to determine the impact of various routine management practices on the shedding rate. The purpose of the research is to develop an understanding of the management factors that contribute to the incidence of *E. coli* 0157:H7 in beef cattle. During the past year, the project has been enlarged to included more monitoring of environmental and wildlife samples to determine reservoirs for *E. coli* 0157:H7.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for the research?

Response. The presence of *E. coli* in beef animals sent to slaughter can contribute to the contamination of meat products produced from such animals. This has increased the need for control measures that could reduce the incidence of such food-borne human pathogens in food animals during the production cycle. With the implementation of mandatory Hazard Analysis Critical Control Point programs for *E. coli* 0157:H7 in slaughter plants, there is increased pressure for the livestock producer to deliver animals to slaughter with reduced prevalence of *E. coli* 0157:H7. This type of research

has been identified as critical by all food animal commodity groups as well as public health officials and consumers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to determine the incidence of *E. coli* 0157:H7 in large versus small beef cow-calf operations and describe the management factors that contribute to or affect the rate of shedding of organisms in the feces of such animals. *E. coli* 0157:H7 has been detected in 3.11 percent of monthly fecal samples (n=3152), with 4.57 percent of the 2058 animals having at least one positive sample. Fecal shedding was normally transient; only one animal was positive on more than one sampling date. In addition, there was a difference in prevalence between farms. Sources of drinking water were also examined and 3.5 percent of 199 water samples were positive. Of particular interest was that 8.3 percent of 24 creek/stream samples and 2.9 percent of 103 pond samples were positive. In addition, isolates of *E. coli* 0157:H7 have been obtained from wildlife, especially deer. Management practices on the ten farms are being examined to determine if there are specific risk factors that can be identified.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1996. The appropriations for fiscal years 1996 through 2000 was $212,000 per year. A total of $1,060,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds by fiscal year?

Response. Non-Federal funds have been contributed to this project as follows: In fiscal year 1996 non-federal funds were $150,000 in state appropriations and $91,450 in contributed indirect costs; 1997 non-federal funds were $165,000 in state appropriated funds and $90,300 in contributed indirect costs; 1998 non-federal funds were $175,000 in state funds and $91,500 in contributed indirect costs; 1999 non-federal funds were $109,957 in state funds and $90,800 in contributed indirect costs.

Mr. Skeen. Where is this work being performed?

Response. This research is being conducted at Kansas State University, University of Nebraska-Lincoln, and at ranches in Kansas, Nebraska, and Colorado.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date was October 1, 1998 for the original objectives. However, the project was not initiated until several months after the expected start date of October 1,1995 and the original objectives were completed in late spring of 1999. As the project has progressed, the Principal Investigator has added other important questions to the original research plan and has planned to look more closely at management interventions that could help reduce the incidence of *E. coli* shedding in beef cattle. During the past year, the project has added objectives which are focused on environmental issues such as prevalence of *E. coli* 0157:H7 in wildlife as well as in various water supplies used by the cattle. Thus the

project is expected to continue for some time after the original expected period of time.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project was evaluated by an on-site visit on October 28-29, 1997. The evaluation noted that the project team was doing an excellent job and the interactive collaboration was outstanding. The research team has been successful in bringing other participants into the program. The project leader provided a very comprehensive written report on November 3, 1998, including manuscripts currently under review for publication, which has permitted a further assessment of the continued progress on this important project. Several scientific papers have been given at scientific meetings and manuscripts are being published as rapidly as data are assembled, analyzed, and prepared for publication.

PRESERVATION AND PROCESSING RESEARCH, OKLAHOMA

Mr. Skeen. Please provide a description of the research that has been funded under the Preservation and Processing Research grant.

Response. Research has focused on the effects of preharvest and postharvest factors on the market quality of fresh and minimally processed horticultural products, including marigolds, pecans, watermelons, peaches, and sage. Researchers are developing harvester prototypes for marigold flowers and drying and threshing systems for marigold petal drying and separation. A fruit orienting mechanism is being developed for incorporation into an on-line grading system. An integrated harvesting and postharvest handling system is being developed for fresh market and processing market horticultural products. Research continues on methods to determine textural properties of pecans, determine optimum operating parameters for supercritical carbon dioxide and other alternative extraction technologies, and develop and optimize modified atmosphere packaging techniques and partial oil extraction for pecan shelf life extension.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that technological improvements in fruit, nut and vegetable handling systems are needed to supply domestic markets and support continued participation in international commerce, which is a national need. New environmentally friendly processing systems have been developed and are being commercialized in Oklahoma, with broad application to numerous crops with international marketing potential. Processing systems under development for commercial adaptation will support market expansion of pecans and sage, affecting product market potential and value regionally. Improvements in postharvest handling and processing are necessary to support growth of the state and national horticulture and related agricultural industries and ensure competitive involvement in national and international commerce of commodities uniquely suited for production in Oklahoma. New extraction facilities will continue to have a positive impact on local economies, incorporating a new value added processing industry, providing local employment opportunities and providing a new local market for Oklahoma produced commodities.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research has been to define the major limitations for maintaining quality of harvested fruits, vegetables and tree nuts and prescribe appropriate harvesting, handling and processing protocols to extend shelf life and marketability of harvested horticultural commodities, thus maintaining profitability of production systems and assuring an economic market niche for Oklahoma producers and food processors. A systems approach to develop complementary cropping, harvesting, handling and processing operations has resulted in development of improved handling systems for cucurbit, tree fruit and herb crops. Nondestructive processing systems for partial oil reduction of tree nuts have been developed to extend shelf life and lower the calorie content for the raw or processed product. A new food extraction facility has started operations in Oklahoma.

Mr. Skeen. How long has the work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1985, $100,000; fiscal year 1986, $142,000; fiscal year 1987, $242,000; fiscal years 1988 and 1989, $267,000 per year; fiscal year 1990, $264,000; fiscal year 1991, $265,000; fiscal year 1992, $282,000; fiscal year 1993, $267,000; fiscal year 1994, $251,000; and fiscal years 1995-2000 $226,000 each year. A total of $3,703,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. State funds have been provided as follows: fiscal year 1991, $126,900; fiscal year 1992, $209,783; fiscal year 1993, $219,243; fiscal year 1994, $308,421; fiscal year 1995, $229,489; year 1996, $366,570; fiscal year 1997, $397,881; fiscal year 1998, $205,662; and fiscal year 1999, $206,334. The State also invested $16,100,000 for development of an Agricultural Products and Food Processing Center and approximately $2 million dollars annually to staff and operate the facility.

Mr. Skeen. Where is the work being carried out?

Response. This work is being conducted at the Oklahoma State Agricultural Experiment Station, in conjunction with ongoing production research at the Wes Watkins Agricultural Research and Extension Center and the South Central Agricultural Research Laboratories.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. It is expected that ongoing research will be completed in 2002. Additional related objectives beyond this date would address further opportunities for horticulture industry growth, innovative food processing technologies and associated economic development.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A review of the proposal supporting the fiscal year 1999 appropriation was conducted on March 31, 1999. The project was evaluated as part of a comprehensive site review in the fall of 1995, with a recommendation by the review team to continue and expand the value-added product development.

RANGELAND ECOSYSTEMS, NM

Mr. Skeen. Please provide a description of the research that has been funded under the Rangeland Ecosystems, NM grant?

Response. Current research is focused on the ecology of noxious and invasive weeds that are endemic to New Mexico's rangelands. Competitive research grants have been awarded that deal with studying the physiological and toxicological effects of these weeds on livestock.

Mr. Skeen. According the research proposal, or the principal researchers, what is the national regional, or local focus for this research?

Response. Noxious weeds are a serious problem in the southwestern United States About one-fifth of the rangeland in Texas and more than one-half in the New Mexico is infested to some degree. Under this program, researchers are working to develop an integrated weed management approach in rangeland ecosystems for that region.

Mr. Skeen. What has the original goal of this research and what has been accomplished?

Response. Accomplished research led to understanding of broom snakeweed and other noxious weeds including a better understanding of plant's strategy for invasion and persistence. The primary focus of research at this time is addressing the need for an integrated weed management approach for noxious weeds, especially broom snakeweed.

Research is addressing three general areas which are ecology and management, biological control and toxicology and animal health. One specific accomplishment is the biological control arena; several plant pathogens and insects are proving to be effective in broom snakeweed's control.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $100,000; fiscal year 1990, $148,000; fiscal year 1991, $150,000; fiscal years 1992 and 1993, $200,000 per year; fiscal year 1994, $188,000; fiscal years 1995 and 1996, $169,000 each year; fiscal year 1997, $175,000; fiscal year 1998, $185,000; and for fiscal years 1999 and 2000, $200,000 per year. A total of $2,084,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows:$249,251 state appropriations in 1991; $200,110 state appropriations in 1992; $334,779 state appropriations in 1993; $302,793 state appropriations in 1994; $294,451 state appropriations in 1995; and an estimated $300,000 in state appropriations in each fiscal year of 1996, 1997, 1998 and 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at New Mexico State University and throughout the State of new Mexico in actual field conditions.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated in 1991. Considerable progress has been made on many of the original objectives. Currently, additional and related objectives have evolved and anticipated completion date for these is 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Each year the grant is peer reviewed with oversight by an administrative executive committee within the College of Agriculture and Home Economics at New Mexico State University. Additionally, CSREES' senior scientific staff review the progress of the grant. Those reviews indicated progress in achieving the objectives.

RED SNAPPER RESEARCH/ALABAMA

Mr. Skeen. Please provide a description of the research that will be funded under the Red Snapper Research grant, Alabama.

Response. The agency is in the process of requesting the university to submit a grant proposal for this new research activity.

Mr. Skeen. According to the research proposal, or the principal research, what is the national, regional or local need for this research?

Response. The researchers indicate that there is a regional need for red snapper research because of its importance to the Gulf states and the fact that it is presently considered to be an over-fished species by commercial and recreational interests. Current harvest limitations mandated by Federal actions have resulted in economic losses to coastal communities. Research will provide critical knowledge in efforts to restore native populations and stimulate the development of aquaculture enterprises in the Gulf region.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This is a new research grant to be funded in fiscal year 2000.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $510,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates that significant non-federal funding will be provided in fiscal year 2000 primarily from state sources to cover salaries of the principal investigators. As the program develops, additional non-federal funding is expected.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted through the Alabama Agricultural Experiment Station at the Claude Peteet Mariculture Center located in Gulf Shores in collaboration with the Alabama Marine Resources Division.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is fiscal year 2001. The project will be initiated in fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency will evaluate the progress of this new project on an annual basis. The university will be required to submit an accomplishment report each year when the new proposal is submitted to the agency for funding. Since this is the first year of the program, the agency will conduct an external peer review of the proposal. The fiscal year 2000 review will be completed within three weeks of submission of the proposal. The researchers will be requested to develop a research proposal consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development.

REGIONAL BARLEY GENE MAPPING PROJECT

Mr. Skeen. Please provide a description of the work that has been funded under the Regional Barley Gene Mapping Project grant.

Response. The Regional Barley Genome Mapping Project is a multi-disciplinary, multi-institutional project to develop a genome map of barley. Specific objectives are to: construct a publicly-available medium resolution barley genome map; use the map to identify and locate loci, especially quantitative trait loci controlling economically-important traits such as yield, maturity, adaptation, resistance to biotic and abiotic stresses, malting quality, and feed value; provide the framework for efficient molecular marker-assisted selection strategies in barley varietal development; identify chromosome regions for further, higher resolution mapping with the objective of characterizing and utilizing genes of interest; and establish a cooperative mapping project ranging from molecular genetics to breeding that will be an organizational model for cereals and other crop plants. All funds are awarded on a competitive basis.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes barley breeders nationwide need information about the location of agriculturally-important genes controlling resistance to biotic and abiotic stresses, yield, and quality factors in order to rapidly develop new, improved cultivars and respond to disease and pest threats. This project provides that information along with appropriate molecular markers to track these traits through the breeding and selection process.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this project has been to develop a restriction fragment length polymorphism map for barley and associated

important genetic traits to provide closely linked molecular markers for barley breeders. The project has developed comprehensive linkage maps defining the entire barley genome in three experimental populations and determined the location, number, effect, and interaction of genes determining a range of economically-important traits. Additionally, the project has supported the development and use of an array of genomics tools that are publicly available. Technical papers have been published to report research results to the scientific community.

Mr. Skeen. How long has this work been under way and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1990, $153,000; fiscal year 1991, $262,000; fiscal years 1992-1993, $412,000 per year; fiscal year 1994, $387,000; fiscal years 1995-1998, $348,000 each year; fiscal year 1999, $400,000; and fiscal year 2000, $425,000. A total of $3,843,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $203,760 from industry in 1991; $212,750 from industry in 1992; $115,000 from industry in 1993; and $89,000 from industry in 1994; and $35,000 from the State of Washington and $108,000 in other non-federal funding, for a total of $143,000 in 1995. Non-federal funds were $163,000 for 1996 and $178,240 in 1997. In 1998, the project received $35,000 from industry. Non federal for 1999 were estimated at $156,000.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted in the following state agricultural experiment stations; Oregon, Colorado, Washington, Montana, Idaho, North Dakota, Minnesota, New York, Virginia and California.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objective was to produce a genetic map of agronomically- important traits of the barley genome. The anticipated time to complete this task was estimated at ten years with completion in 1999. The initial goals have been exceeded; however, maps are never "done". The next step will be physical mapping of gene rich regions in order to study the genes and understand pathways. Researchers will focus on quality and disease resistence. This phase is projected for completion in 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. In 1998, the special grant proposal was subjected to the project approval process at Oregon State University, which is the lead university, and reviewed by an agency scientist. This project is made up of many competitively-awarded mini grants. A subgroup of the National Barley Improvement Committee, which is composed of elected representatives of research, growers, and industry, serves as the peer panel to review and select proposals based on relevance to the original objectives and scientific merit. Multi-disciplinary, multi-institutional, and continuing projects are given the highest priority. The overall project and its mini-grants have been judged to

be scientifically sound and appropriate for the stated objectives, based on comments and rating from peer scientists which is done on each support prior to selection.

REGIONALIZED IMPLICATIONS OF FARM PROGRAMS

Mr. Skeen. Please provide a description of the research that has been done under the program on Regionalized Implications of Farm Programs grant.

Response. The University of Missouri continuously provides regionalized analysis of alternative farm program designs. This includes providing farm level analysis of national changes in agriculture policy.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to give farm-level or micro view of macro-level changes; and to provide as accurate and robust an analysis as possible in order to point out regional differences in policy alternatives.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original, as well as current, goal was and continues to be to provide the farm community, agribusiness groups, and public officials information about farm, trade, and fiscal policy implications by developing regionalized models that reflect farming characteristics for major production regions of the United States. The researchers have developed a farm level policy analysis system encompassing major U.S. farm production regions. This system interfaces with existing agricultural sector models used for farm, macroeconomic, and trade policy analysis. The universities have expanded the number and types of representative farms to 80. Typical farm models also are being developed for Mexico and Canada under a collaborative agreement for use in analyzing impacts of the North American Free Trade Agreement.

Policy studies completed this past year at the request of policymakers and farm groups included analysis of the impacts of marketing loan provisions on farmers' economic viability; drought on farm income and farm viability; early provision of Agricultural Marketing Transaction Act (AMTA) payments, risk management accounts; and other crop insurance and disaster assistance alternatives.

Results of these analysis were presented to more than 60 different groups across the U.S., including, of course, both congressional agriculture committees. The Agricultural Food Policy Center (AFPC) web site, which contains copies of all Working and Briefing Papers, was visited more than 345,000 times during May-November, 1998.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1990 and the appropriation for fiscal year 1990 was $346,000. The fiscal years 1991-1993 appropriations were $348,000 per year; $327,000 in fiscal year 1994; and $294,000 in each of the fiscal years 1995 through 1999. The fiscal year 2000 is $294,000. A total of $3,481,00 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $288,843 State appropriations and $46,773 industry for a total of $335,616 in 1991; $45,661 State appropriations in 1992; $33,979 State appropriations in 1993; $40,967 State appropriations in 1994; $161,876 State appropriations in 1995; $187,717 State appropriations for 1996; and $137,100 for 1997; and $161,400 for 1998.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by the Texas A&M University and University of Missouri at Columbia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This program is of a continuing nature for the purpose of assessing the impacts of existing policies and issues and proposed policy and program changes at the individual firm level for feed grain, wheat, cotton, rice, oilseed and livestock producers. In addition, the representative farms are constantly being updated as farming practices change. Currently the researchers are making adjustments for the increasing use of Bt and Round-Up Ready seeds.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. No formal evaluation of this project has been carried out; however, the CSREES representative is in frequent communication with the principal investigator concerning policy analysis procedures and studies.

RICE MODELING, ARKANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the Rice Modeling grant.

Response. The purpose of this research project is to develop a regional, national and global rice industry model for use in analyzing the impact of changes in domestic and foreign public policies on production, trade, stocks, substitute crops, farm prices and domestic as well as global consumption.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Research is needed to assist both the U.S. rice industry and national policymakers in assessing the impact of existing and proposed changes in public policies for rice. This research enables improved analysis of both international and domestic policy changes on rice production, stocks, prices of substitute crops and consumption. It has been, and is being used to analyze the impacts of farm policy proposals on the U.S. rice industry, to analyze the impact of WTO and the Uruguay Round agreements on U.S. trade, to analyze the impact of emerging rice importing and exporting countries on U.S. rice exports, and to analyze the market for different rice types (qualities) and seasonal demand and supply factors that affect the global rice market. The principal researcher believes this research addresses national, regional and local needs.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to develop international, national and regional models to analyze the impact of foreign and domestic policy changes, and forecast changes in production, trade, stocks, prices of substitute crops, farm prices, and consumption.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work actually began about four years ago and federal research grants from various sources have totaled roughly $2 million prior to this year. The work supported by this grant began in fiscal year 1996. The appropriation for fiscal years 1996 and 1997 was $395,000; for fiscal years 1998, 1999, and 2000, $296,000, for a total appropriation of $1,678,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds over the 4 years prior to this year totaled approximately $500,000. For the 1996 fiscal year, state appropriations were $178,000; and for 1977 and 1998, $150,000.

Mr. Skeen. Where is the work being carried out?

Response. The research is being carried out at the University of Arkansas-Fayetteville and the University of Missouri-Columbia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The domestic portion of the rice model has been completed. The international modeling research is a little over half completed and the researchers estimate another 5 years is required. The purpose of constructing the models, however, is to provide on-going analysis of the impact of various policy proposals on the U.S. rice industry.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. We have conducted no formal evaluation of this project. However, annual proposals are peer reviewed for relevance and scientific merit. Also, each annual budget proposal is carefully reviewed for adherence to stated objectives and annual progress is discussed with the principal investigators.

RURAL DEVELOPMENT CENTERS

Mr. Skeen. Please provide a description of the research that has been funded under the Rural Development Centers Program grant.

Respondent. The overall objectives of the research agenda of the five rural development centers are to: Improve economic competitiveness and diversification in rural areas; support management and strategic planning for economic development; create community capacity through leadership; assist in family and community adjustments to stress and change; and promote constructive use of the environment. The function of the Centers is to increase the productivity of regional faculty both in doing research on rural issues and in using that research to do effective outreach with rural communities. These projects have undergone a merit review.

Mr. Skeen. According to the research proposal, or one of the principal investigators, what is the national, regional or local need for this research?

Respondent. In the context of a global society, rural communities and rural economies are increasingly complex and multi-dimensional. People living in rural America face an ever increasing number of public issues and problems needing resolution. Yet the number of research faculty addressing broader rural issues is declining in many places. The multi-disciplinary, multi-state work supported by the Centers is even more crucial in this context. The four Centers initiate, facilitate, and evaluate research that has direct, positive impacts on the social and economic well-being of individuals, families, communities, small towns and rural places. Center-supported research addresses such rural development issues as rural economic diversification, workforce preparation, the changing demography of rural places, transitions in agriculture, small business and retail trade opportunities, the impacts of welfare reform, the capacity of state and local governments to meet changing public assistance needs, management of natural and environmental resources, public lands policy, water quality, physical infrastructure, food assistance issues among vulnerable populations, education and strengthened human capital, forest stewardship, and access to vital community services. Specific research priorities emerge from on-going dialog with stakeholders and clients in each region and are reviewed annually by the Centers and their Boards of Directors. In addition, in 1999 the Center Directors began a collaborative process to identify critical rural development issues shared across regions and to establish a collaborative national rural research agenda. Together the Centers enhance the capacity of people and communities to carry out expanding responsibilities in the design, management, and financing of government programs and in building healthy, viable communities and families across rural America.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Respondent. The Rural Development Center mission is to strengthen rural families, communities, and businesses by facilitating collaborative research and extension education through land-grant institutions and their partners in the various regions. Research programs are undertaken after evaluating broader regional and national priorities. Following are some accomplishments of selected research activities conducted under the auspices of various centers.

The Southern Regional Development Center (SRDC) is nationally recognized for its *Information Briefs*, prepared to shed light on the host of challenges and opportunities facing governments, communities and people in the South. In a special 1998-71999 series, for example, SRDC sponsored research by land-grant faculty on the South's experience of major welfare reform in the United States. The "Welfare Reform Briefs" now help national, state, and local leaders and officials understand and respond to the devolution of government services, rural transportation issues and welfare reform, family economics and individual development accounts, the cost of living, rural earnings capacity, job opportunities for low-income people, and child care issues. Most recently, SRDC launched its "Millennium Series," research on persistent problems in the rural South as well as optimistic trends. Research underway addresses wage levels, strategies to strengthen the economic health of agricultural and non-agricultural firms, rural racial and ethnic diversity, rapid urbanization and its effects on natural and environmental resources, the demand for better educated workers, progress advancing labor force skill levels, entrepreneurial opportunities and strategies to diversify the rural economy, the changing structure of families and related family services needs,

and barriers to health care quality and access. The planned series of 35 policy briefs will stimulate public dialogue needed to create vibrant, healthy rural communities in the rural South.

Like the other Centers, the SRDC links the research sponsors with extension education in several ways. For example, with land-grant faculty in the southeast, the SRDC developed and sponsors the Southern Regional Community Development Institute. Diverse extension educators (agriculture, natural resources, family and youth development, community development, and middle management) spend five days attending sessions on understanding community, strategic planning, asset-mapping, social infrastructure, local government, problem-solving, economic and sustainable development, and leadership skills. Started in 1998, demand for the training is strong, and SRDC has scheduled its third Institute for summer 2000. Another initiate begun in 1999, the Mid-South Delta Institute, is an on-going participatory research and training program designed to help community leaders of northwest Mississippi expand their understanding of themselves and their communities through asset-mapping, strategic planning, building partnerships, and consensus-building.

The North Central Regional Center for Rural Development (NCRCRD) has an extensive repertoire of research informing policy and community development programs. Its contributions have won national recognition in the areas of workforce preparation, state of the art community visioning and strategic planning, social indicators for community and economic planning, and federal program assessment including the Empowerment Zone/Enterprise Community initiative and national workforce preparation programs. NCRCRD supported research also enhances the scientific methods land-grant faculty use in applied research on rural development. For example, land-grant faculty supported by NCRCRD demonstrates the power and utility of clustering geographic and demographic data and linking geodemographic clusters to Agriculture Census and Decennial data. Other research analyzes the future of small rural trade centers as providers of public services, th dynamics of rural retail trade, and the most critical needs of rural business communities. Through its workshops, conferences, training programs, and newsletter, *Rural Development News*, NCRCRD provides research results and related educational materials to rural development professionals in land-grant and partner institutions and organizations across the country.

Industrial recruitment has been one of the most popular methods of economic development in the U.S. But increasingly, the cost effectiveness of this strategy is being questioned by researchers and practitioners. With the help of research and related training programs, communities are capitalizing on an alternative strategy called Business Retention and Expansion (BR&E). This builds on local economic development efforts by creating teams of local leaders to help communities improve their business climate and identify and address impediments to growth and retention of existing businesses. The Northeast Regional Center for Rural Development (NERCRD) supported the development of BR&E materials that are now used in training workshops across the country, sponsored by Business Retention and Expansion International. Economic development professionals across the US and in Canada have purchased these materials and use them locally to retain and expand existing businesses and reduce the high costs associated with industrial recruitment strategies. Shared internationally, the materials also have been translated into French and Polish.

NERCRD also funded research to assess the consumer credit knowledge of rural poor and ethnic minorities and determine their use of credit and management practices. Based on the research, an educational program that focuses on the wise use of consumer credit has been developed and offered to a

diverse extension audience. This program also contributed to a video that promotes the MONEY 2000 program, encouraging participants to save and/or reduce debt by $2,000 by the end of the year 2000. The video is distributed widely by extension personnel within the region and nation and is used by financial counselors at several military bases. It helps families living paycheck-to-paycheck and struggling with low savings or high household debt. Since it was launched in 1996, MONEY 2000 has helped over 7,000 people in more than 30 states increase their net worth by more than $3 million.

New programs underway at the Western Rural Development Center (WRDC) include research to enhance home-based and micro business opportunities and a "rapid growth toolkit" to help communities address land and natural resource use issues in the midst of economic growth. This builds on the Center's long-standing support for research on the impacts of tourism and its economic impact and promise in the west. In addition, WRDC has been active in BR&E related research. Using a WRDC supported BR&E expansion program, New Mexico State University Extension has helped communities expand their economic base by saving and creating local jobs, and BC Hydro in Burnaby, British Columbia recently requested and received permission to adapt the Business R&E program materials for use in rural Canada.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Respondent. Grants have been awarded from funds appropriated as follows: fiscal year 1971, $75,000; fiscal year 1972, $225,000; fiscal year 1973, $317,000; fiscal years 1974-1981, $300,000 per year; fiscal years 1982-1985, $311,000 per year; fiscal years 1986-1987, $363,000 per year; fiscal year 1988, $475,000; fiscal year 1989, $500,000; fiscal year 1990, $494,000; fiscal years 1991-1993, $500,000 per year; fiscal year 1994, $470,000; fiscal years 1995-1998, $423,000 per year; fiscal year 1999, $523,000; and fiscal year 2000, $523,000. A total of $11,164,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Respondent. Non-federal funds available to the four Regional Centers for Rural Development were: fiscal year 1991, $1,117,000; fiscal year 1992, $790,000; fiscal year 1993, $900,000; fiscal year 1994, $776,591; and fiscal year 1995, $710,0050; for a total of $4,293,641 across the five years for which there are complete data. Non-federal partners sponsoring research and related extension programs through the Centers since 1995 include the Farm Foundation, the University of Kentucky's Tennessee Valley Authority Rural Studies Program, the W. K Kellogg Foundation, the Upjohn Institute, the Kerr Center for Sustainable Agriculture, the National 4-H Council, and the Heartland Center. Other federal partners include the EPA, Small Business Administration, and in USDA – Rural Development, Economic Research Service; Agricultural Research Service; Forest Service; SARE; and National Resource and Conservation Service. In short, in recent years the Centers have established an impressive record of brokering partnerships with private foundations and non-governmental organizations, as well as other federal partners, to meet their goals and extend the impact of their allocated federal dollars.

Mr. Skeen. Where is this work being carried out?

Respondent. The regional rural development centers include the following: Northeast Regional Center for Rural Development; Pennsylvania State University; North Central Regional Center for Rural Development at Iowa State

University; Southern Rural Development Center at Mississippi State University; and Western Rural Development Center at Oregon State University. There is also a rural development project at North Dakota State University which receives funding from the annual Rural Development Centers appropriation Most of the research sponsored by the four regional centers is actually performed by resident faculty at land-grant universities in the respective region through subcontracts from that center's grant.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives.

Respondent. The regional rural development centers were established to provide an on-going "value added" component to link research and extension and by doing so to increase rural development under the special conditions in each region. The work of the Centers is being carried out in all 50 states and in some territories. The Centers compile a report of annual accomplishments and share those with the states in the region. Accomplishments are now shared through sophisticated, interactive web sites. The list of needs is constantly evolving and is being addressed through projects that are matched to the constantly shifting local agenda. The current phase of the program will be completed in fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Respondent. The Centers enlist the help of academic and private/public foundations personnel on advisory committees and boards of directors to help establish operating rules and provide professional, technical counsel and peer evaluation of Center projects and the investigators. The projects are evaluated annually by the advisory committees and the boards of directors against the five key issue areas and the objectives of each project for relevance, achievement, and initial impacts. Follow-up evaluation is carried out by the Center staffs in order to assess long-term impacts of these projects on local communities.

RURAL POLICIES INSTITUTE

Mr. Skeen. Please provide a description of the research that has been funded under the Rural Policies Institute grant.

Response. The Rural Policy Research Institute is a consortium of three universities designed to create a comprehensive approach to rural policy analysis. The Institute conducts research and facilitates public dialogue to increase public understanding of the rural impacts of national, regional, state, and local policies on rural areas of the United States.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. There is a need to estimate the impacts of changing state and national programs and policies on rural people and places. Objective public policy analysis can provide timely and accurate estimates of the impacts of proposed policy changes to allow more reasoned policy discussions and decisions. The principal researcher believes this research meets national, regional and local needs.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the Rural Policy Research Institute (RUPRI) was to create a new model to provide timely, accurate, and unbiased estimates of the impacts of policies and new policy initiatives on rural people and places. During the past four years, RUPRI has analyzed the impact of market-driven health reform and impacts of specific health policy alternatives on rural people; the impact of implementing the Telecommunications Act of 1996, including use of the Universal Service Funds; the impact of welfare reform on rural communities. RUPRI has developed complex models to provide quantitative estimates of economic, demographic, and fiscal effects of policy alternatives on local communities of different types and in different regions. During those same four years, RUPRI has provided 30 analyses for congressional hearings and briefings on critical issues affecting rural America, 100 policy research papers, and developed a popular website. RUPRI's work is published and cited in numerous academic journals, discussed in the media, and widely used by policy decision makers at all levels of government.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by these grants began in fiscal year 1991 and the appropriation for fiscal year 1991 was $375,000. The fiscal year 1992 appropriation was $525,000; for fiscal year 1993, $692,000; for fiscal year 1994, $494,000; and fiscal years 1995-2000, $644,000 each year. A total of $5,950,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Aggregated non-federal funds to support the Rural Policy Research Institute across the three universities involved include unrecovered indirect costs, salary support from university and other non-federal sources, and various other grants, contracts, and reimbursable agreements. They amounted to $316,458 for fiscal year 1991; $417,456 in fiscal year 1992; $605,302 in fiscal year 1993; $537,834 in fiscal year 1994; $584,516 in fiscal year 1995, for fiscal year 1996, $576,782; $186,859 in 1997; $153,614 for 1998; and an estimated $168,450 for 1999. Total to date including the 1999 estimate, is $3,547,271.

Mr. Skeen. Where is this work being carried out?

Response. The Institute's member universities are: the University of Missouri-Columbia; the University of Nebraska-Lincoln; and Iowa State University, Ames.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1991 was for a period of 24 months, however, rural communities continue to be impacted by major socio-economic changes as well as state and federal policy changes. The current phase of the program will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in February 1999, as it evaluated the 1999 project proposal, and determined that:"RUPRI is

an effective interdisciplinary, multistate effort that supports the mandates for collaboration in the Agricultural Research, Extension and Education Reform Act of 1998. Its work supports CSREES strategic goals of enhancing economic opportunity and quality of life. The principal investigator and participants are well qualified to conduct the project."

RUSSIAN WHEAT APHID, COLORADO

Mr. Skeen. Please provide a description of the research that has been funded under the Russian Wheat Aphid grant.

Response. Funding will support two key areas of research that are needed to assure long-term and sustainable Russian wheat aphid management. These are: 1) Discovering new crop genes which provide resistance to the Russian wheat aphid and incorporating them into commercially acceptable wheat varieties, and 2) Integrating the available control tactics into the most effective, efficient, and environmentally sound production systems for the Great Plains.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The Russian wheat aphid is an exotic pest that entered the western United States without its normal complement of biological control agents. This insect has rapidly become the most important insect pest of wheat in the western United States. From 1986-1991, the total economic impact was estimated to be in excess of $657 million. In the same period, some 17.5 million pounds of insecticides were used nationally for Russian wheat aphid control. The cost to American farmers of insecticide treatments was over $70 million. In addition, the intense use of insecticides on a crop that previously received little insecticide treatment raised concerns about the impact on water quality, human health, food safety, non-target organisms, and general environmental quality. Direct losses in Colorado have been as high as $27 million in a single year with an average direct loss of above $11 million per year, since 1987.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals of the research are to: 1) Discover new crop genes which provide resistance to the Russian wheat aphid and incorporate them into commercially acceptable wheat varieties, and 2) Integrate the available control tactics into the most effective, efficient, and environmentally sound production systems for the Great Plains. The techniques of molecular genetics are being employed to reach the goal of identifying new genes for resistance to Russian wheat aphid and incorporating them into commercially acceptable wheat varieties. Several DNA marker technologies used in other plant species have been successfully adapted for mapping Russian wheat aphid resistance genes in wheat. These include restriction fragment length polymorphism and amplified fragment length polymorphism techniques as well as microsatellite markers. Restriction fragment length polymorphism markers were initially used to map two Russian wheat aphid resistance genes - Dn4, the one used in 'Halt' and Dn2, an additional resistance gene that might be suitable for inclusion in a cultivar containing two resistance genes.

A new Russian wheat aphid resistance gene (Dn7), identified by other researchers in South Africa, 94M370, has been crossed with susceptible wheat to generate materials for use in molecular genetic analysis of Dn7 and to

incorporate the gene into wheat. Dn7 is one of the resistance genes that is being targeted for molecular cloning in the Colorado State program.

Two kinds of DNA libraries were developed from 94M370 as additional sources of clones for RFLP mapping: a Pst-I genomic library and a cDNA library. These libraries are very useful because they allow screening for clones in such a way that the DNA from rye can be distinguished from wheat DNA.

In another set of experiments, a cDNA library was made from mRNA extracted from leaf tissues of 94M370. One thousand randomly picked clones from this library are being sequenced. The sequenced clones from the 94M370 library also will be used in the mapping effort.

In addition, the mapping effort of this project will be strengthened by access to cDNA libraries that will be produced under a National Science Foundation grant awarded to a team of U.S. wheat researchers for the purpose of developing tools for wheat genomics.

Once a genetic map is developed, the next step in positional cloning is to determine the physical location of the markers on the chromosomes and the physical distance between the markers. This step is being accomplished by the use of fluorescence in situ hybridization (FISH) techniques.

In order to routinely detect DNA markers on chromosomes by fluorescence in situ hybridization, clones containing large DNA inserts are required. Bacterial artificial chromosomes will be used to meet this requirement. Two Bacterial artificial chromosome libraries are available from other research teams as sources of probes for the FISH experiments. These were screened with five markers linked to either Dn2 or Dn4 and positive Bacterial artificial chromosomes were identified for all five markers. Fluorescence in situ hybridization using these Bacterial artificial chromosome clones to wheat metaphase chromosomes are underway.

A critical factor in the success of fluorescence in situ hybridization is the routine availability of complete chromosome spreads that are flat and free of cytoplasmic material. Procedures have been developed for preparing wheat chromosome spreads that are flat and intact.

Another critical factor in the fluorescence in situ hybridization experiments is the ability to distinguish the target chromosome from the rest of the wheat chromosomes. Target chromosomes include 1RS/1BL, which contains Dn7; 1D, which contains Dn4; and 7D, which contains Dn2. Several techniques are being used to distinguish the desired chromosomes.

Progress has been made in Integrating Tactics for Management of the Russian wheat aphid. In 1998, experimental dryland cropping systems were established in eastern Colorado. To be as realistic as possible, two of these are located in growers fields and have been designed with grower input and are managed jointly with the grower-cooperator. Long-term studies were initiated to compare the experimental systems with typical wheat production systems in the area. The experimental systems were designed to optimize the effects of environmentally sound pest management tactics (particularly resistant cultivars, the effects of cultural practices, such as planting date, harvesting date, grazing, *et cetera.*, and biological control, such as reducing Russian wheat aphid numbers through the actions of predators and parasites. In addition, the experimental systems were designed to optimize water use efficiency and other agronomic and profitability factors.

At each location, wheat and other adapted dryland crops are grown in proximity to each other so that interactions among various crops and various production practices can be studied. Rotations over time of wheat with other crops also are being investigated. These large-scale experimental systems will be ideal arenas in which to determine the best way to apply the knowledge

already gained about specific aspects of Russian wheat aphid biology and ecology, production practices, and the effectiveness of naturally occurring Russian wheat aphid parasites and predators. These large-scale experimental cropping systems also will provide valuable information on Russian wheat aphid management to wheat growers who are considering adding additional crops to their dryland cropping systems.

In 1999 data were collected on a wide variety of agronomic and pest variables. Initial observations on Russian wheat aphid indicated enhanced biological control in the more diverse, experimental cropping systems. The enhancement occurred just prior to planting the fall wheat crop which is one of the most critical points in Russian wheat aphid seasonal dynamics.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 and the appropriation for fiscal years 1998, 1999 and 2000 is $200,000 for a total of $600,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year.

Response. State appropriations and the Colorado Wheat Administrative Committee have demonstrated strong support for this effort. The total per year is approximately $775,000 in new funding from the state of Colorado and redirected funds from within the university.

Mr. Skeen. Where is the work being carried out?

Response. Research will be conducted on the campus of Colorado State University, at Colorado State University research stations, and on the farms of cooperators throughout Colorado. Outreach and extension activities will be focused on wheat growers in Colorado, Nebraska, Wyoming, Kansas, New Mexico, Texas, and Oklahoma.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This project is anticipated to continue for a total of five years with a completion date of July 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project was evaluated by a Cooperative State Research, Education and Extension Service site visit on February 4 and 5, 1999. Laboratory, greenhouse and field research facilities available for the research program are considered to be excellent. Greenhouse space appears adequate for the work and the units are well adapted for the wheat breeding program. Rearing facilities and the support personnel for maintaining a source of aphids used for bioassays are excellent. Research laboratories are very well equipped for the studies, either proposed or underway and there is strong technical support for the research which involves application of techniques of molecular genetics to wheat breeding. The research scientists represent strengths in both classical or traditional wheat breeding and new molecular genetics-based wheat breeding. The group also has strong, well recognized expertise in Russian wheat aphid biology, ecology and management as well as in dryland wheat production systems used in the Great Plains states.

The project is a multifaceted, multi-disciplinary program which is directed toward long-term solutions for Russian wheat aphid management utilizing a viable combination of approaches which requires the type of facilities and equipment available at this location.

SEAFOOD HARVESTING, PROCESSING, AND MARKETING, ALASKA

Mr. Skeen. Please provide a description of the research that has been funded under the Seafood Harvesting, Processing, and Marketing grant.

Response. This is a new project to be started in fiscal year 2000. Research related to seafood safety, quality and by-product utilization will be supported by this grant. CSREES has requested the University to submit a proposal, which has not yet been received, in support of fiscal year 2000 funds.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This will be determined after the proposal is received from the principal investigator.

Mr. Skeen. What is the original goal of the research and what has been accomplished to date?

Response. This will be determined after the proposal is received from the principal investigator.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This is a new project for fiscal year 2000. For fiscal year 2000 $552,500 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. This will be determined as the project progresses.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted by scientists at the University of Alaska, Fairbanks.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. This will be proposed by the principal investigator(s) soon.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. As this is a new project, no evaluation has been conducted at this time.

SEAFOOD HARVESTING, PROCESSING, AND MARKETING, MISSISSIPPI

Mr. Skeen. Please provide a description of the research that has been funded under the Seafood Harvesting, Processing, and Marketing grant.

Response. Research related to seafood safety, quality and by-product utilization has been supported by this grant. Research conducted included: 1) microbial population changes during retail display of shrimp, 2) development of an impedance-based method to rapidly detect microorganisms on shrimp, 3) determine physical, chemical, microbiological, and sensory differences between pond and tank aquaculture tilapia, and 4) evaluate processes for utilization of uncooked shrimp processing by-products for production of flavor extracts. Funds from the fiscal year 1999 grant are supporting research through September 30, 2000. A proposal in support of fiscal year 2000 funds will be requested to 1) evaluate the potential of the xanthene colorant phloxine B to control Listeria monocytogenes on ready-to-eat shrimp and 2) determine the survival of organic acid exposed Listeria monocytogenes in a simulated gastrointestinal model.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes that national needs reflected in the project include providing consumers with affordable alternative seafood products. Alternative sources of seafood protein are needed because of a drastic decline in natural harvests due to overexploitation. Other national needs addressed in this project include reducing pollution during seafood and aquaculture food processing by converting byproducts into value-added food ingredients or materials. Regionally, much is unknown about the short and long-term effects of the new seafood HACCP regulations on the livelihood of Mississippi seafood and aquaculture food producers and processors who are typically small and lack sufficient resources to remain competitive. Continuation of this project will provide continued assistance to Gulf-Coast seafood processors in meeting new U.S. regulations as well as new international regulations that are important for Mississippi export products. Locally, catfish processors are a major employer of the severely economically depressed Delta region of Mississippi. By further enhancing the value of catfish products, this project seeks to improve the livelihood of individuals both on the Gulf coast and in the aquaculture region of the state.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The original goals of the research were to improve the quality and safety of catfish and improve the utilization of catfish byproducts and underutilized marine species. Due to successes of the original project, subsequent efforts are focusing on additional uses of seafood and aquaculture foods by improving processing strategies and providing alternative products from waste materials. The project has thus expanded to include crab, shrimp, oysters, freshwater prawns, hybrid striped bass, tilapia, and crawfish.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1990 when $368,000 was appropriated for this project. The appropriations for fiscal years 1991-1993 were $361,000 per year; fiscal year 1994, $339,000; and fiscal years 1995-1999, $305,000 each year. For fiscal year 2000 $305,000 has been appropriated. A total of $3,867,500 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. The State of Mississippi contributed $1,949 to this project in fiscal year 1991; $41,286 in fiscal year 1992; $67,072 in fiscal year 1993; $91,215 in fiscal year 1994; $147,911 in fiscal year 1995; and $61,848 in fiscal year 1996. Product sales contributed $7,044 in 1991, $13,481 in 1992, $13,704 in 1993, and $5,901 in 1994. Industry grants contributed $14 in 1992 and $31,796 in 1993. Other non-federal funds contributed $80 in fiscal year 1991, $838 in 1992, and $17,823 in 1993. The total non-federal funds contributed to this project from 1991 through 1996 was $501,962. In fiscal year 1998, $151,286 in state funds, $8,790 in self-generated funds, and $23,877 in other non-federal funds were obtained. Information on funding in 1999 and 2000 is not currently available.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by scientists in the Departments of Food Science and Technology and Agricultural Economics of the Mississippi Agricultural and Forestry Experiment Station at Mississippi State University and at the Coastal Research and Extension Center, Seafood Processing Laboratory, in Pascagoula, Mississippi.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The original, scheduled date of completion of the objectives will be September 30, 2000. The work for fiscal year 1999 is still in progress. A progress report on the achievement of the objectives was due by March 15, 2000. It should be noted that the work on this project over the last fiscal year was severely curtailed due to extensive damage to the seafood processing pilot plant and destruction of the office facility, both located in Pascagoula, due to Hurricane

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. The last review of the proposal was conducted on June 28,1999. At that time, the agency science specialist believed that the projects addressed needs and interests of the regional seafood and aquaculture industries.

SEAFOOD SAFETY/MASSACHUSETTS

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. The agency is in the process of requesting the university to submit a grant proposal for this new research activity.

Mr. Skeen. According to the research proposal, or the principal research, what is the national, regional or local need for this research?

Response. The researchers indicate the need to strengthen the local and Northeast region fisheries industry by addressing and solving priority seafood safety issues critical to assuring public health and maintaining consumer confidence in a variety of economically important fisheries products.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This is a new research grant to be funded in fiscal year 2000.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $255,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates that significant non-federal funding will be provided in fiscal year 2000 primarily from state sources to cover salaries of the principal investigators. As the program develops, additional non-federal funding is expected.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at the University of Massachusetts - Amherst, Chenoweth Laboratory of the Department of Food Science through the Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is fiscal year 2002. The project will be initiated in fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency will evaluate the progress of this new project on an annual basis. The university will be required to submit an accomplishment report each year when the new proposal is submitted to the agency for funding. Since this is the first year of the program, the agency will conduct an external peer review of the proposal. The fiscal year 2000 review will be completed within three weeks of submission of the proposal.

SMALL FRUIT RESEARCH, OREGON

Mr. Skeen. Please provide a description of the research that has been funded under the Small Fruit Research grant.

Response. Funding for this special grant has been used to enhance the production and quality of small fruits-blackberry, blueberry, caneberry, cranberry, marionberry, raspberry, strawberry and grape in the Pacific Northwestern states of Idaho, Oregon, and Washington. Research has been focused on crop genetics, production/physiology, pest management, berry/grape processing, marketing, and wine production. Proposals are selected after examination of their relevance to priorities identified within the region.

Mr. Skeen. According the research proposal, or the principal researcher, what is the national, regional and local need for this research?

Response. There is a considerable demand for fresh and processed berry products in the United States. The demand is also high in urban Asian markets where consumer interest for berry products is strong. Currently, international marketing of Northwest small fruit commodities involves the sale of

traditional products. Research on international consumer preferences, packaging, and products continues to be essential. The importance of berry and grape crops to the region has long been recognized by the three Northwest states: Washington, Idaho and Oregon. These crops are mainstays of high-value, specialty horticulture. The universities and small fruits industry have made a strong commitment to the improvement of these crops as evidenced by the high level of internally developed resources for research and marketing. Thus, the Northwest Center for Small Fruit Research has developed effectively over the last 8-10 years into its present fully established form.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. Genetic improvement of small fruit cultivars continues to be a powerful tool using germplasm collection and identification, field evaluation of new germplasm and advanced selections from breeding programs, virus identification and elimination, and approaches that utilize genetic engineering. Research is identifying cultivars and developing cultural practices that growers can utilize to reduce crop losses. Research is evaluating and investigating nutritional factors, cultural management, temperature stress, effects of pruning, micro propagation, cold hardiness/low temperature injury and effects of viticulture practices on wine quality of winery processing on wine quality. Small fruit research continues to reap acclaim for its components involving industry-driven cooperation between industry, state and federal research. Its genesis as a small-fruits program reflects the contributions of plant biology, the commitment to facilitating the efficiency of research and the coordination of marketing throughout a multi-state region. The Center represents an innovative organization which has created a cooperative strategy for university, USDA's--Agricultural Research Service--, and industry small fruit programs.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000.

Response. The initial support for this grant was an appropriation in fiscal year 1991 for $125,000. The fiscal appropriation for 1992 and 1993 was $187,000 per year; fiscal year 1994 was $235,000; fiscal years 1995-1998 were $212,000 each year; fiscal year 1999 was $300,000; and was $300,000 for fiscal year 2000. A total of $2,182,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-Federal funds provided by fiscal year?

Response. This project involves the use of OSU administrative personnel, equipment, utilities and facilities that are indirect costs to the project. These costs constitute an OSU contribution to this research project, which is not allowable as a reimbursable expense under this project. The recent passage of Oregon's tax limitation laws reduce revenues that restrict our ability to cost share. Thus, our policy is that we do not provide any cost sharing or matching funds for this or other agreements in which we receive no indirect costs. We are committed to providing the required collaborative efforts by Oregon State University scientists and administrators to complete the work described in this proposal.

Mr. Skeen. Where is the work being carried out?

Response. The research is being conducted at Oregon State University, Washington State University and the University of Idaho. Oregon State University is the lead institution for this project.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives of small fruit research are still valid researchable issues because they encompass research focused on such diverse topics as: crop genetics, production/physiology, pest management, berry/grape processing, marketing, wine production, international consumer preferences, and specialty horticulture. Much progress has taken place in meeting the research objectives in these topics but this is a continuing process with priorities annually re-evaluated to appropriately adjust research direction within the project objectives as well as their relevance to priorities identified within the region.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. There has not been an overall agency evaluation of this project. However, the project evaluation process is accomplished annually by peer reviewers whom are chosen and organized by expertise according to the five technical working groups with input from the designated Agricultural Experiment Station Representatives in Washington, Oregon and Idaho. In fiscal year 1999, for example, there were 19 project reports which were evaluated for each of the recipients of grants. Each submitted proposal is peer-reviewed by a panel of five individuals (three scientists and two industry representatives) and is grouped into one of the Center Technical Working Groups, namely genetics, pest management, production/physiology, processing/packaging, and marketing. Each proposal is evaluated on the following criteria: 1) The nature of the proposed research and its relevance to the needs of the small fruit industries; 2) The relevance of the proposal to current small fruit research designated priorities; 3) The scientific expertise of the scientists involved---training, experience, and accomplishments relative to specific areas of small fruit research; 4) The appropriateness of the level of funding requested, vis-a-vis, availability of funds; and 5) The likelihood of success. Reviewers complete an evaluation sheet for each proposal, rating the five criteria on a scale of one to ten, with ten being the best. Previously awarded projects are given special consideration in order to allow for funding for up to three years (when appropriate progress is demonstrated). Compilation of evaluations are distributed to the three Agricultural Experiment Station Directors and the USDA-ARS Horticultural Crops Research Laboratory Research Leader, who make the final determination of funding for each proposed project. Notification of awards are made in December. The peer review of all proposals is coordinated and processed through the Northwest Center for Small Fruit. An agency-level site review of the Small Fruit Research project will be performed in the coming year.

SOUTHWEST CONSORTIUM FOR PLANT GENETICS AND WATER RESOURCES

Mr. Skeen. Please provide a description of the work that has been funded under the Southwest Consortium for Plant Genetics and Water Resources Program grant.

Response. New Mexico State University, Los Alamos National Laboratory, Texas Tech University, the University of Arizona, and the University of California at Riverside entered into a cooperative interdisciplinary research agreement constituted as the Southwest Consortium for Plant Genetics and Water Resources to facilitate research relevant to crop adaptation to and semi-arid regions. The overall goal of the Consortium is to bring together multi-

disciplinary scientific teams to develop innovative advances in plant biotechnology and related areas to bear on agriculture and water use in and semi-arid regions. All grants made to the participating Institutions are awarded competitively by a scientific peer review process.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This research is highly significant to national, regional, and local needs. The Consortium is conducting an integrated program that identifies specific problems of southwest agriculture, coordinates water and biotechnology research aimed at solving these problems, and facilitates the transfer of this information for commercialization. The specific research objectives of the Consortium include the development of crops with resistance to drought and temperature extremes, adverse soil conditions, and pests and parasites.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to enhance the adaptation of agricultural crops to and semi-arid crop environments. Five participating institutions have developed research plans consistent with the Consortium's goals. Mini-grants to support research that would solve problems unique to southwest agriculture are awarded competitively following peer review. Specific attention is given to interdisciplinary agricultural research. Since its inception in 1985, the Consortium has provided essential support for the establishment of baseline data on new, forward thinking research relevant to the improvement of and lands agriculture. Accomplishments include the identification of chromosome regions conferring water use and transpiration efficiency in wheat, an analysis of the impacts of water stress on host plant resistance to aphids and whiteflies on melon, and an evaluation of genetic variation of water-soluble carbohydrates in spring wheat and salt-tolerance mechanisms.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1986 and has been provided with appropriations of the following amounts: fiscal year 1986, $285,000; fiscal years 1987 through 1989, $385,000 per year; fiscal year 1990, $380,000; fiscal years 1991 through 1993, $400,000 per year; fiscal year 1994, $376,000; and fiscal years 1995 through 2000, $338,000 per year. A total of $5,424,000 has been appropriated since fiscal year 1986.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The Consortium's lead institution, New Mexico State University, reports matching non-federal funds of $80,000 in state appropriations in 1992 and $100,000 in 1993 through 1998. Non-federal funds spent on this project originate from the five institutions that participate in the Consortium and support researchers' salaries, facilities, equipment maintenance, and administrative assistance.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by the member institutions of the consortium, which includes New Mexico State University; Los Alamos National

Laboratory, Texas Tech University; the University of Arizona, and the University of California at Riverside.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated in 1986 and accomplished significant results in the first five years. Additional and related objectives have been developed and anticipated completion date for these is 2001. The Consortium is successfully achieving its objectives through the funding of new interdisciplinary projects each year.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Mini-grants are awarded competitively to support research that will solve problems unique to agricultural production in the Southwest. The mini-grant selection process is competitive. Proposals are evaluated by external peer reviewers, the Consortium Steering Committee, and the Consortium Scientific Committee. The review process includes pre-proposal screening by the Consortium Steering and Scientific committees, and review of all new proposals by external and internal panels. An internal review of a progress report on each project is completed before the second year of funding is released.

SOYBEAN CYST NEMATODE

Mr. Skeen. Please provide a description of the research that has been funded under the Soybean Cyst Nematode grant.

Response. The research being funded by this grant is crucial to the development of effective management strategies to understand host parasite relationships of the pathosystems and each of its components. Work has dealt mainly with identifying *Heterodera glycines*-resistant genes and incorporating them into agronomically superior cultivars. Basic studies elucidate the fundamental biology of the cyst nematode in regard to new management strategies. Applied work dealt with evaluating production systems and to new management strategies. This project was not awarded competitively but has undergone peer review at the university level and merit review at CSREES.

Mr. Skeen. According to the research proposal, or the principal investigator, what is the national, regional, or local need for the research?

Response. The principal researcher believes that although this research is focused on the soybean cyst nematodes in Missouri, the problems are of regional and national significance. The soybean cyst nematode, *Heterodera glycines* is the most serious pest of soybean in the United States. The problems continue to increase in the Midwest where 12 states have yield reductions in soybean because of this nematode. Due to the nematodes ability to adapt to resistant varieties over time, new varieties are continually needed.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research is managing soybean cyst nematode through the various management strategies including the development of new resistant soybean varieties. To date, several nematode resistant soybean

lines have been or will be released. The need for breeding soybean lines to develop resistant varieties with a broad spectrum of resistance continues. More fundamental research involves the utilization of new molecular technologies to identify genes responsible for resistance. DNA fingerprinting of 118 soybean lines have identified several different genes for soybean cyst nematode resistance. Other aspects of the work relates to field management strategies for these nematodes. Studies on nitrogen fertilizers and tillage have indicated that these may not be important in management of soybean cyst nematode.

Mr. Skeen. How long has work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1979, $150,000; fiscal years 1980-1981, $250,000 per year; fiscal year 1982, $240,000; fiscal years 1983-1985, $300,000 per year; fiscal years 1986-1989, $285,000 per year; fiscal year 1990, $281,000, fiscal year 1991, $ $330,000; fiscal years 1992-1993, $359,000, fiscal year 1994, $337,000; fiscal years 1995-1997, $303,000 per year; fiscal year 1998, $450,000; fiscal year 1999, $475,000 and fiscal year 2000, $475,000. A total of $6,880,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $105,012 state appropriations in 1991; $84,368 state appropriations in 1992; $168,017 state appropriations in 1993; $118,725 state appropriations in 1994; $33,498 in 1995 and 1996; $33,723 in state appropriations in 1997; $37,445 in state appropriations in 1998; $201,994 in 1999; and an estimated $200,000 in 2000.

Mr. Skeen. Where is this work carried out?

Response. This research is being conducted at the Missouri Agriculture Experiment Station and the University of Missouri.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Many objectives are being met but genetic interaction of the soybean cyst nematode/soybean is extremely complex. The anticipated completion date of the continuing research is 2004-2006.

Mr. Skeen. What was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last evaluation of this project was a merit review in January, 1999 and the renewal project will be evaluated in 2000. In summary, continued development of new management strategies for the soybean cyst nematode is extremely important. Progress continues with new varieties with nematode resistance being released yearly as well as excellent progress in other management strategies. Certified seed of MPV437-NRR was made available to farmers in 1999. A new soybean variety, 'Anand' was released this year. Another high yielding soybean strain, S96-1908 was developed that is resistant to all races of soybean cyst nematodes and is being evaluated in the uniform tests. More fundamental research involves the utilization of new molecular technologies to identify genes responsible for resistance. Seven genetic

markers associated with loci controlling resistance to soybean cyst nematode were found in Peking which may be useful in marker assisted selection for resistant lines. Other aspects of the works relates to field management strategies for these nematodes including effects of nutrient uptake on nematode development. A seven year study of the effects of soybean cyst nematode on soybean growth and development was recently completed. It showed among other things, that a grower's choice of tillage methods and date of planting are relatively unimportant in their strategy to control soybean cyst nematodes. Another study indicated that nitrogen accumulation and fixation are limited under high soybean cyst nematode infections.

STEEP - WATER QUALITY IN PACIFIC NORTHWEST

Mr. Skeen. Please provide a description of the research that has been funded under the STEEP - Water Quality in the Pacific Northwest grant.

Response. The STEEP III study was established in 1996 as the third phase of the tri-state STEEP Program entitled "Solutions to Environmental and Economic Problems," to meet the needs of farmers and ranchers in the Pacific Northwest in solving severe problems with soil erosion and water quality, while maintaining economically and environmentally sustainable agricultural production. An open call for research proposals is held by three cooperating states, Idaho, Oregon, and Washington. Awards are made competitively after both internal and external peer reviews within the states, and merit review by the agency. The project is in a new phase, and is just known as STEEP, as the STEEP III objectives have been completed.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. According to the research proposal, the soils of the Pacific Northwest wheat region are subject to severe wind and water erosion, which has taken a heavy toll of the topsoil in a little more than 100 years of farming. Due to the hilly terrain, water erosion has reduced potential soil productivity in the high rainfall areas of the region by about 50 percent. Wind erosion has reduced productivity on the sandy soils in the lower rainfall areas. Also, off-site environmental costs of water erosion are large. Although many of these are difficult to measure, they include damage from sediment to recreational areas, roadways, and other areas which costs taxpayers millions of dollars annually. Wind erosion, which occurs mostly in the spring and fall, also can be costly and environmentally damaging to air quality, and causes increasing concerns for human health and safety from blowing dusts. Water quality degradation is of increasing concern in the agricultural areas of this region, since sediment is a major pollutant of surface water runoff which may also carry potential chemical contaminants. The complex hydrology of the region's landscape has made it difficult to identify the sources of these chemicals in surface and ground waters. A new major emphasis has been the funding of direct seed research in combination with a reduction in summer fallow and more complex crop rotations. Direct seed is synonymous with no till where tillage is eliminated or reduced to a very minimum. Consequently soil and wind erosion are reduced significantly, improving soil and water quality and contributing to salmon recovery.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The primary goals are: to obtain and integrate new technical/scientific information on soils, crop plants, pests, energy, and farm profitability into sustainable, management systems; to develop tools for

assessing the impacts of farming practices on soil erosion and water quality; and to disseminate conservation technology to the farm.

The original STEEP and following STEEP II and STEEP III projects for erosion and water quality control, have provided growers a steady flow of information and technologies that have helped them meet economic, environmental, and resource conservation goals. Through the adoption of these technologies, the researchers believe that growers of wheat, barley, and other alternative crops have been able to reduce soil erosion by water and wind, improve water quality, and maintain or increase farm profitability. This has been accomplished through a tri-state, multi-disciplinary, multi-agency approach of basic and applied research, along with technology transfer and on-farm testing to assist growers with applying these research findings on their farms. The on-farm testing program has directly involved growers and stakeholders in the planning and conduct of the research and educational efforts--and has helped growers evaluate conservation options, such as residue management, to meet conservation compliance requirements.

STEEP programs have helped position farmers with new conservation technologies, such as direct seeding management systems, well in advance of deadlines to meet current and anticipated policy requirements. This preparation protects farmers against potential penalties and loss of government program benefits. The new emphasis on direct seeding has significantly reduced summer fallow through more annual cropping, and through more emphasis on alternative crops.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 1999?

Response. The work supported by this grant began in fiscal year 1991, and the appropriations for fiscal years 1991-1993 were $980,000 per year; in fiscal year 1994, $921,000; in fiscal year 1995, $829,000; and in fiscal years 1996-2000, $500,000 per year. A total of $7,190,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $938,812 state appropriations, $63,954 product sales, $156,656 industry, and $16,994 miscellaneous in 1991; $1,025,534 state appropriations, $75,795 product sales, $124,919 industry, and $88,696 miscellaneous in 1992; $962,921 state appropriations, $62,776 product sales, $177,109 industry and $11,028 miscellaneous in 1993; $1,069,396 state appropriations, $46,582 product sales, $169,628 industry, and $22,697 miscellaneous in 1994; and $1,013,562 state appropriations, $31,314 industry, and $107,151 miscellaneous in 1995. In 1996, Washington received $231,724 state appropriations; Oregon passed Measure 5 which reduced revenues and imposed funding restrictions so they were unable to provide any non-federal cost-sharing or matching funds; and Idaho contributed $81,525 state support, and $86,242 in estimated non-federal grant support, for a total non-federal contribution of $167,767. In 1997, Washington received $197,234 state appropriations; Oregon continues to have Measure 5 as law and continues to be unable to provide any non-federal cost-sharing or matching funds; and Idaho contributed $27,235 state support and $24,525 in estimated non-federal grant support for a total non-federal contribution of $51,760. In 1998 and 1999, these same general levels of support have been continued.

Mr. Skeen. Where is this work being carried out?

Response. The work under STEEP will be done at laboratories and field research sites at the University of Idaho, Oregon State University, and Washington State University. Cooperative on-farm testing will be conducted in cooperation with growers on their fields in Idaho, Oregon and Washington.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The STEEP II project was completed in 1995, and the results were compiled in a final, 5-year report in January 1997, showing that the original objectives have largely been met. The STEEP III project started in 1996 and will continue through the year 2000 as a 5-year project.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency's program manager annually reviews progress reports, proposes new research on the STEEP Program, and attends the annual meetings to assess progress. The program is evaluated within the states each year by three committees: grower, technical, and administrative. Annual progress is reported at an annual meeting and compiled into written reports. These reports and the meeting are reviewed annually. Grower and industry input is solicited at the annual meeting on research objectives and accomplishments. The most recent evaluation was made at the January 2000 annual meeting which highlighted direct-seeding technology. This successful meeting attracted many growers, scientists, and agricultural experts from the tri-state region. Farmer surveys are also distributed at each annual meeting, and results compiled to assess whether objectives are being successfully achieved.

SUSTAINABLE AGRICULTURE, CALIFORNIA

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received.

Mr. Skeen. According to the research proposal or the principal researcher, what is the national, regional, or local need for this research?

Response. Since this is the first year of funding for this project, and the research proposal has not yet been received, that question cannot be answered at this time.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. Since the research proposal has not yet been received, and the project has not yet been funded, there are no stated goals nor accomplishments to report at this time.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $255,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Since the project has not yet been funded, there are no non-federal funds to report at this time.

Mr. Skeen. Where is this work being carried out?

Response. The specific locations for this work in California are not yet available.

Mr. Skeen. What was the anticipated completion date for the original objectives of this project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives and completion date have not yet been determined.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last agency evaluation conducted.

Response. No evaluation has yet taken place since the project has not yet begun.

SUSTAINABLE AGRICULTURE, MICHIGAN

Mr. Skeen. Please provide a description of the research that has been funded under the Sustainable Agriculture, Michigan program grant.

Response. This project is intended to develop agricultural production systems that are highly productive and profitable and which provide high quality ecosystem services to local communities and to the environment. It examines how to achieve a high nutrient flow from soil to crops and animals, and back to soil, with low loss to ground and surface waters. The grant is allocated, by the Michigan Agricultural Experiment Station, to priority areas within the general area of sustainable agriculture. Grants are awarded based on research merit and proposal submission.

Mr. Skeen. According to the research proposal or the principal researcher, what is the national, regional, or local need for this research.

Response. The principal researcher believes there is a need to better understand the biological processes occurring Michigan's high-nutrient-flow crop and animal systems. With high water tables, networks of lakes and slow-moving streams, and concern about environmental standards, field contamination by agricultural production materials is a high priority.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The objective of this research is the identification, quantification and description of production ecology information to permit its use in a significant way in farm management decision making. Key areas addressed include soil carbon and nitrogen flows, soil nematode population management and weed seed predation and seedbank management.

Accomplishments to date include the development of on-farm compost demonstration sites, collection of research data and computer software models on water table management, completion of initial research trials on rotational grazing at three sites in Michigan, widespread testing of cover crops in

several crop rotation systems, and tests of the use of nematology community structure as a method of detecting difference among farming systems. Findings from this project have demonstrated that rotational grazing reduces production costs, and increases net profits, compared to traditional cow management. This project has also shown that composting is an effective way of stabilizing livestock waste, controlling odor, and improving nutrient composition for later land application. Cover crop development as an integrated tool is becoming quite advanced. Frost seeding of wheat with clover is increasingly used; approximately one-third of Michigan's wheat acreage, by some estimates, is overseeded. Results are being integrated into a series of practical publications partially supported by this grant. The first in the series, "Michigan Field Crop Ecology," received an American Society of Agronomy award in 1998 for excellence as an Extension publication. A second volume, on field crop pest ecology, and similar volumes for fruit and vegetable ecology are under development.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1994 with an appropriation of $494,000; $445,000 were appropriated in fiscal years 1995 through 2000, bringing total appropriations to $3,164,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Matching funds were provided at the state level for $511,900 in FY 1994, $372,319 for FY 1995, and $359,679 in FY 1996. Matching support was not reported in fiscal years 1997 through 1999.

Mr. Skeen. Where is this work being carried out?

Response. This work is being carried out in Michigan at several locations by Michigan State University. Locations include the Kellogg Biological Station, the Upper Peninsula Experiment Station, and farms around the state.

Mr. Skeen. What was the anticipated completion date for the original objectives of this project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original project, begun in 1994, was proposed through April of 1997. Its specific objectives were met, with additional objectives addressed in subsequent related proposals. The current project is currently scheduled to go through June 30, 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last agency evaluation conducted.

Response. A formal evaluation of the Principal Investigator's program was concluded in 1997, commissioned by the C.S. Mott Foundation through an independent consultant. The project continues to have annual peer review. According to the Principal Investigator, the proposal has gone through the normal Michigan State University review process. First, all teams and collaborators of the project have met and reviewed the entire proposal with several suggestions and changes being incorporated. Secondly, research administrators in the fields of agronomy/soil science and entomology/pest management covering the major dimensions of the proposal have reviewed it for scientific appropriateness and accuracy as well as for overall balance and

likelihood of achieving objectives. Their comments have been included as revisions to the proposal.

SUSTAINABLE AND NATURAL RESOURCES, PENNSYLVANIA

Mr. Skeen. Please provide a description of the research that has been funded under the Sustainable Agriculture and Natural Resources, Pennsylvania project.

Response. This project studies the cycling of nutrients in soil and crops with special emphasis on the development of indices for measurement of soil health. Specific goals are to identify indicators of a soil ecosystem that maintains a high level of active soil organic matter, and to develop nutrient and carbon budgets for managing on-farm cropping systems.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Degradation of soil health/quality is a most serious problem for agriculture both in the mid-Atlantic region and throughout the nation. State governments both regionally and nationally are attempting to address the issue of soil and water degradation in cropping systems and in intensive animal agriculture. Traditional soil test results are not providing the needed answers for effective nutrient management.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to understand the cycling of nutrients and to use that knowledge to develop practical indicators of soil quality and health. If farmers are to manage their farm lands properly, indicators of soil quality and health must be developed that can be used by agricultural producers and consultants. Efforts under this project have been devoted to this goal with significant accomplishments to date. Management practices have been found to affect soil microbiology, and the fate of nutrients from crop residues and legume cover crops is being elucidated. A significant indicator of soil quality has been identified: measurement of the decomposition of filter paper has been shown to be an effective indicator of plant residue decomposition, which in turn has been shown to be highly correlated to nitrogen mineralization and also shows promise as an indicator of soil biological activity. Experiments are underway to refine this approach.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported under this grant began in fiscal year 1993. The appropriation for fiscal year 1993 was $100,000; $94,000 in fiscal years 1994 through 1998; $95,000 in fiscal years 1999 and 2000, for a total of $760,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. According to the principal investigator, non-federal funds from university, state, and private industry sources were as follows: $195,901 in 1996, $369,574 in 1997, $324,724 in 1998, and $36,469 in 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by the Pennsylvania State University with cooperators throughout the state, at the Hunter Rotation Experiment at Penn State's R.E. Larson Research Center near Rock Springs, Pennsylvania, at the Rodale Institute Research Center near Kutztown, Pennsylvania, and on farms around the state.

Mr. Skeen. What was the anticipated completion date for the original objectives of this project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project has met the specific objectives set forth in the original project which began in 1993 with an ending date in 1995. The continuing project addresses additional objectives related to the overall goal. The ending date for the current project objectives is June 30, 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last agency evaluation conducted.

Response. There has not been a formal evaluation of this project, but progress reports have been submitted to the agency and reviewed by our scientific staff. The project undergoes regular internal evaluation and assessment as part of Penn State's major effort in soil quality and nutrient management research.

SUSTAINABLE AGRICULTURE SYSTEMS, NEBRASKA

Mr. Skeen. Please provide a description of the research that has been funded under the integrated crop and livestock research program for Nebraska.

Response. This project is aimed at integration of field crops, animal production, agroforestry, livestock waste management, and diversified enterprises to meet production, economic, and environmental quality goals.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Farmers and ranchers in Nebraska and throughout the Midwest face increasing difficulties in maintaining profitable operations that are sustainable under increased production costs and more stringent environmental regulations. They continue to seek alternative production systems, integration of crop and animal enterprises, value-added products, including those from woody perennials, and new marketing approaches to secure more of the food dollar. Work on crop residue utilization is highly important to assess the loss of erosion mitigation when grazing occurs as well as the benefits of winter forage to production of lean beef. Erosion is still a major problem with monoculture cropping, and work with contour strips, residue management, and animal grazing is essential to provide good recommendations to farmers for how to manage fragile lands.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This project has addressed a number of questions related to the management of integrated crop and livestock enterprises. The work on composting has answered questions about the costs of composting, improved the nutrient content of compost, and evaluated different spreading technologies. The work on contour strip cropping, residue management, no-till planting, and cover crops has demonstrated ways to reduce erosion on highly erodible land. Studies of grazing on corn residues under different tillage and management

systems are determining the forage value of residue and the impact of grazing on subsequent crop production.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. This project began in fiscal year 1992, with an appropriation of $70,000; subsequent appropriations are as follows: $70,000 in fiscal year 1993; $66,000 in fiscal year 1994; and $59,000 in fiscal years 1995 through 2000. Total appropriations to date are $560,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Matching funds provided for this research include state funds in the amount of $25,313 for fiscal year 1992; $26,384 for fiscal year 1993; $27,306 for fiscal year 1994; $36,091 in fiscal year 1995; and $24,267 in fiscal year 1996. No matching funds were reported in fiscal years 1997 through 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted by the University of Nebraska at several locations in Nebraska, with the major part of the project at the Agricultural Research and Development Center near Mead, Nebraska.

Mr. Skeen. What was the anticipated completion date for the original objectives of this project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original project proposed work through March of 1994. The current project proposes work addressing additional related objectives through March 31, 2002. It is expected that current objectives of the project will be met by this time period.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last agency evaluation conducted.

Response. There has not been a formal evaluation of this project, but progress reports have been submitted to the agency and reviewed by our scientific staff. The grant was awarded competitively within the University of Nebraska, and the integrated farm project has been reviewed annually for technical merit and progress toward goals by the internal review process of the university.

SUSTAINABLE BEEF SUPPLY, MONTANA

Mr. Skeen. Please provide a description of the research that has been funded under the Sustainable Beef Supply, Montana grant.

Response. The Sustainable Beef Supply, Montana project is a cooperative effort between Montana State University and the Montana Stockgrowers Association to develop a system to provide information feedback among various segments of the beef industry. This may be one of only a very few joint efforts between a university and a commodity group currently in progress in the United States. A systems approach is being utilized to monitor and track calves from ranches in Montana to feedlots in other states and eventually to the packing plant. Information collected throughout the production cycle is shared among all owners of the cattle.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is to develop a reliable and predictable supply of safe, consumer-friendly beef of high quality. The beef industry is becoming more consumer focused, and specific quality and consistency targets are being established in all segments of the industry. To meet consumer needs and return additional revenue to cattle producers, a systems network must be in place to ensure that a high quality and consistent product is being produced. Central to this networking approach is the exchange of information among all segments of the industry from producer to consumer.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goals of this project are: Develop and conduct educational programs on how to attain beef quality assurance standards, provide certification of feeder calves that have met defined management protocols, and provide information feedback from the feedlot and packing plant to the cow-calf producer to determine if the feeder calves met requirements for quality, consistency, safety, and red meat yield. A training manual was developed and 1,000 copies were distributed. Thirty-five quality assurance educational programs were conducted in Montana and county extension agents were trained to deliver this program to producers. Approximately 25,000 calves were certified. A statewide audit of ranchers has been initiated to determine what value-added practices are being utilized related to breeding, health management, nutrition and marketing. A research project involving 2,000 calves at 12 ranches has been initiated to determine if a standardized weaning protocol of vaccinations and nutrition can reduce the morbidity of calves after they enter the feedlot.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999. The appropriation for fiscal year 1999 was $500,000 and for fiscal year 2000 was $637,500 for a total appropriation of $1,137,500. There are no other sources of funding available from other CSREES programs.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The Montana Department of Agriculture has contributed $15,000 and the Montana Stockgrowers Association has contributed $5,000 in fiscal year 2000.

Mr. Skeen. Where is this work being carried out?

Response. Research will be conducted at Montana State University and on cooperating Montana ranches.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. It is anticipated that it will take three to four years of funding to fully achieve the objectives of this project. Progress to date has been very encouraging. Approximately 1,000 producers have received quality assurance training and 25,000 calves were certified as being managed under

specified best management practices. The goal is to certify 75,000 calves annually in this program.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This is a new project and is not far enough along to be effectively evaluated. The project was peer-reviewed at the University before submission. The proposal was also merit reviewed by the agency prior to funding.

SUSTAINABLE PEST MANAGEMENT FOR DRYLAND WHEAT, MONTANA

Mr. Skeen. Please provide a description of the research that has been funded under the Sustainable Pest Management for Dryland Wheat, Montana grant.

Response. Montana State University researchers are studying the influence of four cropping sequences and two tillage systems on insects, weeds, plant pathogens, nutrient management, physical and biological properties of soil, economic profitability, and environmental benefits. The research is being conducted on large experimental blocks in the three different dryland farming regions of northern, central, and eastern Montana. Each site differs climatologically and agronomically from one another yet represents a significant production area within the state.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. This project addresses pest management issues under different cropping sequences and tillage practices utilized in the Northern Great Plains for dryland wheat production. The wheat-fallow-wheat system used by many farmers in the region favors the build up of many pests. Dollar losses due to insects, competitive weeds, and plant pathogens in dryland wheat production in Montana alone are staggering. For example, annual losses attributed to wheat stem sawfly exceeds $25 million; wild oat infestations causes an estimated $50 million in harvest losses and management costs; and wheat streak mosaic has a monetary loss of $37.5 million. These and other pests also increase reliance on pesticides for crop protection which impacts environmental quality, increases production costs, and causes secondary pest outbreaks and resistance. The agronomic, environmental, and economical benefits of diversified crop rotations are numerous, but these benefits are largely unknown or not documented in dryland wheat production. As a result of this multi-disciplinary project, we can significantly reduce the economic impact of agriculturally important pests, improve soil health, reduce production costs, and improve production efficiency.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The second cropping season was completed at the northcentral site in 1999. Data were collected from 26 different cropping sequences grown under two tillage systems. Crops grown included spring wheat, pea, chickpea, and lentil, cool oilseed, for example, mustard, warm oilseed, or safflower, and sunflower. Numerous physical and chemical attributes of the soil were measured again in 1999 including available nutrients, soil aggregate characteristics, pH, forms of nitrogen, bulk density, salinity, water flow rates and water holding capacity. There was no detectable wheat streak mosaic virus and there was no evidence of foliar fungal diseases in any of the wheat plots. Crop data taken included dates of plant emergence, vegetative dry

matter, yield components, and straw residue. Above ground insects in different crop rotations were estimated by sweep samples, sticky traps and pheromone traps. Soil-inhabiting arthropods were sampled by removing soil cores from selected cropping sequences.

The first cropping season was completed at the central location in 1999. The crop rotations include 5 sequences of cereals, oilseeds, legumes and forages grown under high and low input systems. High input treatments included seeding at the recommended times for maximizing yields, seeding at recommended rates, band applying nitrogen fertilizer, and implementing a standard herbicide program. Low inputs were characterized by delaying seeding of cereal until annual weeds have emerged, seeding small grains at 90 lb/ac, and applying herbicides only as needed. Data were recorded throughout the growing season at this site in 1999 on physical and chemical attributes of soils, plant pathogens, insects, weeds, and crop emergence, vegetative dry matter, yield components, and residue cover.

The main treatment effects and cropping sequences at the third research site in northeast Montana are currently being established. Ground preparation through mechanical tillage and herbicide applications at this site began in fall 1998. The entire 25 acre site was cropped to spring wheat in 1999.

Related investigations currently supported by this project include a weed science study delineating the spatial distribution of wild oats and wheat stem sawfly in dryland spring wheat. A second project focuses on the chemical ecology of wheat stem sawflies. We now have convincing evidence that male and female sawflies produce different compounds that are vital in locating mates. Experiments have been designed to collect, isolate and identify chemical volatiles released by sawflies. A dozen compounds have been identified as components of pheromones released by sawflies. An experimental trap design with a synthetic pheromone lure was field tested in 1999 and proven to be effective in attracting sawflies. Thus, the feasibility of using sawfly pheromones to manage this ubiquitous pest appears achievable.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This work supported by this grant began in fiscal year 1997 and the appropriation for fiscal year 1997 was $200,000, for fiscal years 1998 and 1999, $400,000 per year and for fiscal year 2000, $425,000. A total of $1,425,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds of $42,000, $80,000 and $80,000 from the Montana Wheat and Barley Committee were provided for project support during 1997, 1998 and 1999, respectively. The Montana Agricultural Experiment Station provided $25,000 in state support. Private industries provided $5,000 during 1999.

Mr. Skeen. Where is the work being carried out?

Response. Research is being conducted in three distinct dryland areas of Montana in the north, central and northeast, located on producer owned land. Each field site is within 45 miles of a Montana State University Agriculture Experiment Station research center.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initially proposed for a duration of 3 years. However, this project is envisioned as a long term project and will require a total of 12 years to see it to completion.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Yearly progress reports will be used to track the effectiveness of the program of research with the first agency evaluation scheduled for October 2000. Assessment of the precision of biological control organisms and estimates of profitability, marketability, and risk will be used to assess progress.

SWINE WASTE MANAGEMENT, NORTH CAROLINA

Mr. Skeen. Please provide a description of the research that has been funded under the Swine Waste Management, North Carolina, grant.

Response. During the past year, this multi-disciplinary project has expanded existing university efforts that have included plans to develop a prototype system for the treatment of animal waste which will be used to study and optimize new and innovative swine waste treatment processes. Specifically, the current project is focusing on the following topics: biological safety and nutrient quality of phosphoric acid-preserved animal mortality products processed by rendering, extrusion, and fluidized-bed cooking/dehydration; beneficial effects of swine manure biosolids on plant disease suppression; evaluation of alternative compost products; use of processed animal waste as a nitrogen and phosphorus source for Fraser Fir Christmas trees; production of a commercially viable feed ingredient from animal wastes, cull sweet potatoes and soybean hulls; routine techniques for monitoring the nutritional value of processed animal waste; residual dietary phytase activity; and phosphorus, calcium and nitrogen content in fresh and composted manure.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The urgency for addressing environmental concerns relative to the intensive production of livestock and poultry continues to intensify in the United States. This is reflected by strategies currently proposed jointly by the U. S. Environmental Protection Agency and U. S. Department of Agriculture. In North Carolina, where livestock and poultry production account for approximately $5 billion in farm gate income annually, issues of adequate land area for recycling animal manures for crop uptake of nitrogen and phosphorus in some counties of intensive animal agriculture is especially sensitive. North Carolina is also currently in the process of implementing odor rules that will impact animal agriculture. Several other states and local regions are facing the same concerns. It is anticipated that deliverables from this research project will have a local, state and national impact.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The specific goals for this project include the following. Utilize the North Carolina State University Animal Poultry Waste Management Center waste processing facility to develop optimum methods processing animal waste-based nutrients for use as value-added products. Installation of solid separation system at the Animal Poultry Waste Management Center waste processing facility. Collect samples and establish supply sources of various types of animal waste by-products for conducting commercial scale processing and end-product evaluations. Evaluate materials processed for plant nutrients or feedstuffs. Set up and conduct field demonstration involving potential market use for value-added products produced. Complete summary of data for publication and presentation at workshops, conferences and professional meetings

These goals required assimilation of a multidisciplinary research team, and completion of facilities that are able to heat treat, dehydrate, blend, extrude, compost and pelletize the by- products to produce potentially valuable organic fertilizers or feed supplements. These tasks have been completed, and the individual projects described previously are underway.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1997 and the appropriation for fiscal year 1997 was $215,000; fiscal year 1998 was $300,00; fiscal year 1999 was $500,000; and fiscal year 2000 is $500,000. A total of $1,515,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This federally funded project has helped leverage funds procured from the state as well as private sector. For example, during the past fiscal year approximately $735,000 in state funds have been provided--for the development and demonstration of alternative swine waste treatment technologies--plus approximately $150,000 from industry and commodity groups in support of objectives related to this project.

Mr. Skeen. Where is this work being carried out?

Response. This work is being conducted at North Carolina State University in Raleigh, North Carolina.

Mr. Skeen. What was the anticipated date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original anticipated completion date was February 1999. Project objectives were not completed by this date. The time to complete processes associated with equipment, facilities and safety plans required for this project, coupled with unavoidable administrative delays in the secondary award process from federal and university level for this project, required a request for extension of the completion date to February 2000. It is anticipated that most project objectives will be completed by February 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The CSREES conducted an evaluation of the progress of this work during January, 2000. The project has made significant progress towards meeting the original goals.

TILLAGE, SILVICULTURE, AND WASTE MANAGEMENT, LOUISIANA

Mr. Skeen. Please provide a description of the research that has been funded under the Tillage, Silviculture, and Waste Management Research Grant?

Response. This research has six components: Rice and Cotton Tillage, Bald Cypress and Water Tupelo Silviculture, and Dairy and Poultry Waste Management. More specifically, the Rice Scientists are looking for ways to improve stand establishment; the Cotton Scientists are focusing on the use of tillage systems to combat harmful insect populations; the Waste Management Scientists are quantifying the environmental and economic effectiveness of approved dairy and poultry waste disposal systems; and the Silviculturists are conducting a problem analysis on factors affecting Bald Cypress and Water Tupelo regeneration. The project is annually subjected to the university's merit review process.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researchers hypothesize that the crops, forests, and waste issues addressed by this project extend beyond the state borders, thus this research has, at a minimum, multi-state to regional application.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goals were to: improve conservation tillage in rice and cotton farming; determine the effectiveness of no-discharge dairy waste treatment facilities; determine acceptable land treatment levels for poultry waste disposal; and to evaluate wetland forest regeneration processes. All components of the project have established research studies and are monitoring progress. For fiscal year 1998 the silviculture component was placed on hold and a sweet potato project was added. This decision was prompted by a staffing change in the Department of Forestry and Wildlife. Prior to this decision, an annotated bibliography of Bald Cypress Silviculture was completed and the responsible scientists had begun work on Water Tupelo regeneration.

Mr. Skeen. How long has the project been underway, and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. The work began in fiscal year 1994. The appropriation for fiscal year 1994 was $235,000. For fiscal years 1995-2000 the appropriation was $212,000. This sums $1,507,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. State funding in support of these areas of research exceeds $750,000 annually.

Mr. Skeen. Where is the work being carried out?

Response. Investigations are being conducted on the main campus at Louisiana State University--LSU--as well as the LSU's Experiment Stations at

Calhoun, Crowley, Chase, Winnsboro, St. Joseph, and Washington Parish, Louisiana.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related projects?

Response. The original work was scheduled for completion in 1999. Early term objectives have been met. The added experiments have closing dates ranging from 1999 -2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted?

Response. The last field evaluation was completed on December 12, 1995. The evaluation summary complimented the scientists on the interdisciplinary components associated with this project, along with their investigative procedures, report writing, and external networking.

TOMATO WILT VIRUS, GEORGIA

Mr. Skeen. Please provide a description of the research that has been funded under the tomato wilt virus research program grant.

Response. This project supports research to help in the reduction of major crop losses in the southeastern United States due to Tomato Spotted Wilt Disease. Research focuses on vector biology and the virus transmitted by the vector. This project was not awarded competitively but has undergone peer review at the university level and merit review at CSREES.

Mr. Skeen. According to this research proposal, or the principal investigator, what is the national, regional, or local need for this research?

Response. Tomato Wilt Virus has become a major yield-limiting constraint on a number of very important food crops. This is a problem world-wide, but in the last ten year spread throughout the Southeastern states. Since this virus was first observed in Georgia in 1986, it has caused an estimated $100 million crop loss to the state. The wide host range of the virus and its vector make this a disease that is difficult to manage. The new strategies to manage this virus in Georgia will be applicable to all states where it occurs.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research is to reduce losses in the major crops grown in the Southwest due to spotted wilt. This requires identifying the sources of virus and vectors, determining the dynamics of the thrips species that transmit the virus, elucidating how the virus is acquired by thrips to identify possible genes to enhance virus resistance in plants, and adapting to crops in the Southeast the Risk Assessment Index for spotted wilt that is currently in implementation and refinement at the University of Georgia for peanut.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This grant began in 1999 and has been supported at the level of $200,000 in fiscal years 1999 and 2000. A total of $400,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds provided for this grant are $84,736 for 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being carried out at the University of Georgia and The Coastal Plain Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives have not been met since this is a complex research area. The anticipated completion date for the continuing research is 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project has undergone peer review at the University level and an agency merit review in January, 1999. In summary, some progress has been made on all objectives of this research. Some progress has been made in understanding the relationship of cellular receptor proteins in the guts of the vector. This will aid in the identification, characterization and eventually cloning of these genes that then could be modified against the virus. Progress was also made in investigating the source of inoculum and seasonal dynamics of the vector. This included identification of several weed species that are alternative virus hosts. The Risk Assessment Index for management of spotted wilt disease was used to evaluate peanut cultivars and determine how they fit better into management of the virus on peanut.

TROPICAL AQUACULTURE/FLORIDA

Mr. Skeen. Please provide a description of the research that has been funded under the grant.

Response. The agency is in the process of requesting the university to submit a grant proposal for this new research activity.

Mr. Skeen. According to the research proposal, or the principal research, what is the national, regional or local need for this research?

Response. The researchers indicate that the ornamental fish industry is unique and important to the local economy where 69 percent of the total domestic production of ornamental fish occurs in Hillsborough County and 95 percent of the total production of ornamental fish is in southern Florida. At a national level, the United States imports 60-70 percent of the ornamental fish sold. This results in a significant trade deficit that can be reduced by increased domestic production.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. This is a new research grant to be funded in fiscal year 2000.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $170,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates that significant non-federal funding will be provided in fiscal year 2000 primarily from state sources to cover salaries of the principal investigators and operating expenses for the laboratory. As the program develops, additional non-federal funding is expected.

Mr. Skeen. Where is this work being carried out?

Response. Research will be primarily conducted at the University of Florida's Tropical Aquaculture Laboratory located in Ruskin with some work to be done also at the main campus.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is fiscal year 2001. The project will be initiated in fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency will evaluate the progress of this new project on an annual basis. The university will be required to submit an accomplishment report each year when the new proposal is submitted for funding. Since this is the first year of the program, the agency will conduct an external peer review of the proposal. The fiscal year 2000 review will be completed within three weeks of submission of the proposal. The researchers will be requested to develop a research proposal consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development.

TROPICAL AND SUBTROPICAL RESEARCH

Mr. Skeen. Please provide a description of the research that has been funded under the tropical and subtropical research program grant.

Response. Tropical and Subtropical Research--T STAR--Program is operating in coordination with the T STAR Caribbean and the T STAR Pacific Administrative Groups. State Agricultural Experiment Stations that are members of the Caribbean group are Florida, Puerto Rico, and the Virgin Islands; members of the Pacific group are Hawaii and Guam. The proposals are peer reviewed and are then selected for funding by the administrative groups.

Non-member institutional interests are represented by the Executive Director of the Southern Region Agricultural Experiment Station Directors, who is a member of the Caribbean group, and the Executive Director of the Western Region Agricultural Experiment Station Directors, who is a member of the Pacific group. The Agricultural Research Service also has representation on the two groups, as does the CSREES scientist who manages the T STAR grant program.

Funds for the program are divided equally between the two Basin Administrative Groups. The research objective of the program developed by the principal is to improve the agricultural productivity of many of the subtropical and tropical parts of the United States. Special research grants have been awarded for research on controlling insect, disease, and weed pests of crops; increasing the production and quality of tropical fruits, vegetables, and agronomic crops; promoting increased beef production through development of superior pastures; detection of heartwater disease of cattle and the influence of heat stress on dairy cattle reproduction; better use of land and water resources; developing computer models for efficient crop production systems and animal feeding systems; developing computer models for land-use decisions; using biotechnology methodologies for improving plant resistance to viral and bacterial diseases; using biotechnology to develop non-chemical, or biological, strategies for controlling insect pests; and potential for growing new speciality crops.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes this program provides research-generated knowledge that enables informed choices in the responsible use of natural resources, facilitates the health and well being of American citizens through improved food safety and nutrition, provides frontline protection for the rest of the nation's farms and ranches from serious plant and animal diseases and pests, and enhances the ability of U.S. farmers to produce crops efficiently and economically and/or to introduce new crops and agricultural products with export potential to gain market share abroad. On a regional basis, the T STAR program addresses the unique challenges of practicing tropical agriculture, that is, presence of pests year-round, heat stress, post-harvest processing to meet regulatory requirements for export, etc. The local need of Americans living in tropical regions of the nation for T STAR knowledge-based products is to design and implement sustainable agricultural development within fragile tropical agroecosystems--particularly on tropical islands--and to develop new crops and niche markets.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to increase the production and quality of tropical crops; control pests and diseases of plants and animals; promote increased beef production; and conserve land and water resources. Grants have supported research on control strategies for Melon thrips; the biochemical nature of resistance to rust in nutsedge; development of bioherbicides for nutsedges; development of tomato cultivars with resistance to the spotted wilt virus; development of pheromones for monitoring and controlling the citrus root weevil; reducing the effects of heat stress in dairy cattle; development of a decision support system for vegetable production; finding cucurbits with resistance to silverleaf, developing a computer program for optimal supplementation strategies for beef and dairy cattle on tropical pastures; characterizing new strains of citrus tristeza virus in the Caribbean basin; determining the economic threshold for the citrus leaf miner on limes; using viral replicase genes to engineer rapid detection methods for geminiviruses; developing makers of bacterial spot resistance genes in tomato; breeding snap and kidney beans for resistance to golden mosaic virus and for heat tolerance; searching for resistance to papaya bunchy top disease; developing weed control for yam production; and bioengineering ringspot virus resistance in papaya.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The operation of the tropical and subtropical research program was transferred from the Agricultural Research Service to the CSREES, with funding being first provided in fiscal year 1983. Funds in the amount of $2,980,000 per year were appropriated in fiscal years 1983 and 1984. In fiscal year 1985, $3,250,000 was appropriated. In fiscal years 1986, 1987, and 1988, $3,091,000 was appropriated each year. $3,341,000 was appropriated in fiscal year 1989. The fiscal year 1990 appropriation was $3,299,000. The fiscal years 1991-1993 appropriations were $3,320,000 per year; $3,121,000 in fiscal year 1994; $2,809,000 in fiscal years 1995-1996 per year; and $2,724,000 per year in fiscal years 1997 through 2000. A total of $54,718,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. For fiscal year 1997, more than $1 million of non-federal funds were
provided to the T STAR program from state appropriations; for 1998 $856,000; and for 1999
$158,500. These state funds were in the form of faculty salary time commitments and indirect costs covered by the institutions.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted in Florida, Puerto Rico, Virgin Islands,
Hawaii, and Guam. Work is also being done in other Pacific and Caribbean countries through agreements between institutions but not using Federal funds.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional re related objectives?

Response. Research on tropical crop and animal agriculture to increase productivity net profits, decrease harmful environmental impacts, conserve water, and natural resources. Objectives for some projects have been completed and new objectives addressing new issues are being developed in this ongoing project.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The projects that are funded by the T STAR Special Research Grant have been peer reviewed by panels of scientists in the United States to assure that good science is undertaken. Also, as part of the grant renewal process, progress reports are reviewed by the two Administrative Groups and by the grant manager at the national level. Workshops in which research results and their application for agricultural production are developed are conducted every two years. Research papers are published in the appropriate regional, national, and international forums available.

The development in 1995 of the Strategic Plan for T STAR provided a mechanism to define priorities, examine program direction, and recommend operational changes. One of the principal points considered was to bring the Caribbean and Pacific Basin components closer and better coordinated. T STAR and the coordination which it implies was an outcome that will make this program

better. Each sub project is peer reviewed annually at the initiating institution by the T STAR panel and by the agency National Program Leaders.

TURKEY CARNAVIRUS, INDIANA

Mr. Skeen. Please provide a description of the research that has been funded under the Turkey Coronavirus, IN grant.

Response. The objectives of the research will be to: (1) develop enzyme-linked immunosorbent assays for detecting antibody to turkey coronavirus and turkey coronavirus antigen in turkey flocks, (2) elucidate immune responses in turkey poults infected with turkey coronavirus, and (3) determine which immunity, humoral and /or cellular, will provide the most effective protection for turkey poults against turkey coronavirus infection.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need for this research is that the turkey industry plays a major role in animal agriculture in the U.S. This enteric disease of young turkey poults, called turkey poult enteritis or poult enteritis mortality syndrome, has contributed to significant economic losses by producers in Indiana, North Carolina, South Carolina, Virginia and other states. The cost to the industry is in the millions. Currently, no effective medication or vaccination is available for control and prevention of the disease. Although turkey poults that recover from the coronaviral enteritis may develop long-term immunity, little is known about the specific immunity. The proposed research will lead to further study on the understanding of immunological interaction between turkey poults and individual turkey coronaviral proteins and subsequent development of recombinant or a deoxyribonucleic acid vaccine for effective prevention of the disease. The enzyme-linked immunosorbent assays that will be developed in this research will provide an efficient tool for diagnosis and control of turkey poult enteritis.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research was to develop enzyme-linked immunosorbent assays for monitoring antibody to turkey coronavirus and turkey coronavirus antigen in turkey flocks during acute outbreaks or recovery and in routine health monitoring and to develop effective vaccines to protect turkey poults against turkey coronavirus infection.

The investigators' laboratories have successfully propagated turkey coronavirus from intestines of infected turkey poults in 22-day-old turkey embryos, purified turkey coronavirus from the embryo intestines and have demonstrated an acute enteritis with decreased body weight gain in 7 or 10-day-old turkey poults by oral inoculation of the purified turkey coronavirus. This establishes an infection model to study immunology, pathogenicity, and pathogenesis of turkey coronavirus.

Turkey coronavirus has failed to adapt to grow in cell cultures after numerous attempts, hindering the development of antibody-capture enzyme-linked immunosorbent assay --ELISA-- for antibody to turkey coronavirus that requires a large amount of highly purified turkey coronavirus antigens. Nevertheless, another alternative antigen source for ELISA has been investigated. Antibody to turkey coronavirus was found to be cross-reactive with infectious bronchitis virus antigen. An antibody-capture ELISA for detection of antibody to turkey coronavirus utilizing commercially-available ELISA plates coated

with infectious bronchitis virus antigens is being developed. Since large numbers of clinical samples can be handled by ELISA rapidly and accurately, successful development of ELISA for antibody to turkey coronavirus will provide the turkey industry with a sensitive and specific tool for the diagnosis and control of turkey coronavirus infection.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999. The appropriation for fiscal year 1999 was $200,000 and for fiscal year 2000 was $200,000, for a total of $400,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds expended on this project in fiscal year 1999 were $72,311.06. These funds included $25,200 from state funds and $47,111.06 from a private commodity group.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at Purdue University in the Department of Veterinary Pathobiology and the Animal Disease Diagnostic Laboratory.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is December 31, 2001. At present the project is on target to meet its stated objectives in the designated time period.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project was initially funded on July 19, 1999 and no evaluation has been performed since that time.

URBAN PESTS, GEORGIA

Mr. Skeen. Please provide a description of the research that has been funded under the Urban Pests, Georgia grant.

Response. This research is focused on urban pests with specific emphasis on termites and ants. This project has been evaluated annually by CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes subterranean termites and ants are significant economic pests in the Southeastern United States. Damage and control costs for termites in Georgia were estimated at $44.5 million in 1993. It is estimated that professional pest control operators apply over 23 million pounds of active ingredients in and around homes each year. Chemicals currently registered for controlling these pests are less efficacious than desired and applied at an intensity that exceeds most agricultural settings.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the termite research is to better understand the biology of subterranean termites and their responses to selected environmental cues in order to design monitoring, risk assessment, and precision-targeting control strategies using conventional and alternative methods. Additionally, an objective is to improve the identification of subterranean termites to the species level through studies of the termite genome, cuticular chemistry, morphometric characteristics and termite behavior. Specific accomplishments in the termite research are as follows: Multi-disciplinary research using morphometric comparisons, agonism bioassays, chemotaxonomic phenotypes, mark-release-recapture and genetic analysis shows that subterranean termite populations display a multiple-queen colony organization. This field research also proved that termite movement between established feeding sites is not random. It demonstrates that current understanding of termite population structure must be reconsidered. It is clear from this work that termite population structure cannot be determined using only a single technique, like the current industry standard of mark-release-recapture, and that the organization of termite populations is dynamic. This work raises questions concerning the implementation of termite baiting control tactics and claims of structural protection using the current termite baiting technology which in the past four years has become a multi-million dollar industry in the United States. This same multi-disciplinary research approach has demonstrated that the Formosan termites from 7 separate sites in the Atlanta, Georgia, Metro Area were from a single maternal line and that this maternal line originated from New Orleans, Louisiana not, Charleston, South Carolina as originally suggested. The research also provided strong evidence that the subterranean termite species that is infesting areas in and around Paris and Southwestern France is from the United States, not southern Europe. Research on new chemistries demonstrated that the currently registered non-repellent termiticides require longer than 10 minute exposure times at concentrations at least twice the current registered application rates to effect greater than 90 percent mortality in the termites tested in bioassay. This work cannot explain the purported field efficacy of the new termite control concept of the "treatment zone" which allows termites to penetrate the soil but kills them before they breach the barrier and infest a structure. Field and laboratory research with insect pathogenic fungi used as a biological control agent indicate that multiple soil applications are required and that population impacts are likely limited to the area of application not disparate feeding sites. Laboratory research on wood treatments using borate materials indicates that these materials discourage termite feeding but not exploration for additional, untreated wood. Tests designed to treat infested structural wood using a new insecticide chemistry provided evidence of killing termites at sites untreated by the insecticide but known to be visited by the population of termites in the treated area.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1991 and the appropriation for fiscal years 1991 - 1993 was $76,000 per year. In fiscal year 1994 the appropriation was $71,000 and in fiscal years 1995 through 2000 the appropriation was $64,000 each year. A total of $683,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant by fiscal year were as follows: 1991 - none, 1992 - $26,000, 1993 - $18,000, 1994 - $59,530, 1995 - $59,539, 1996 - $30,000, 1997 -$80,00, 1998- $50,000, and 1999 - $100,000.

Mr. Skeen. Where is the work being carried out?

Response. This research and technology transfer program is being conducted at the University of Georgia, Department of Entomology, Athens, Georgia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The grants have been processed on a year to year basis pending the availability of funds, however, the original objectives were essentially a five- to eight-year plan of work. CSREES entomologists judge that excellent progress has been made in meeting the objectives, especially on foraging behavior and the identification and development of termite baits.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project has been evaluated on an annual basis by CSREES through progress reports and by evaluation of contributions presented through the Entomological Society of America meetings in December of 1999.

VIDALIA ONIONS, GEORGIA

Mr. Skeen. Please provide a description of the research that has been funded under the Vidalia Onions, Georgia grant.

Response. The research has concentrated on developing pungency testing procedures to improve quality and sensory consistency of Vidalia onions.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for the research?

Response. Vidalia onions are a specialty crop of extreme importance to the economy of certain areas of Georgia. The project is directed toward improving product quality and the nationally and internationally economic competitiveness of this production system.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The research has demonstrated that chemical tests can be used to accurately predict the pungency of onions prior to harvest, and perhaps flavor categorization, to consumers. The results have also indicated that several diseases affecting onions are the most serious problem in regard to quality and production.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The project was funded for $84,000 for 1998; for $100,000 in fiscal year 1999; and for $100,000 in fiscal year 2000. A total of $284,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year.

Response. The non-federal funding for this project for the last two years was $193,137 from the state of Georgia and $251,427 in private funding.

Mr. Skeen. Where is the work being carried out?

Response. The work is being conducted at the Coastal Plain Experiment Station in Tifton, Georgia and in test plots in several commercial field sites.

Mr. Skeen. What was the anticipated completion date for the original objections of the project? Have those objectives been met? What is the anticipated completion date of additional objectives?

Response. The anticipated duration for the original project was five years. The initial objective of establishing procedures for pungency testing has proceeded ahead of schedule. The plant disease problems that have emerged will likely require several additional years, although the incidence and severity of these diseases are highly variable from year to year.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project is in its second year and a CSREES review has not yet been done.

VITICULTURE CONSORTIUM, NEW YORK & CALIFORNIA

Mr. Skeen. Please provide a description of the research that has been funded under the Viticulture Consortium grant.

Response. The University of California and Cornell University in New York conducted research on varietal responses of grapes, modeling of water requirements, management of diseases including *Phyloxera* and other cultural aspects of grape production. Funds were used by the lead institutions to fund projects in the various grape producing states within their region. Grants were made based on peer reviewed proposals and selected competitively by regional groups based on priorities developed by researchers, extension, and industry personnel.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The research being carried out is designed to help the viticulture and wine industries remain competitive in the U.S. and in the global market. Further, disease and insect problems are a concern of the industry, especially in new strains of *phyloxera* while overall improvement in all cultural management approaches to grape production need to continue.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research is to maintain or enhance the competitiveness of the U. S. Viticulture and wine industry in the global market.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1996-1997, $500,000 per year; fiscal year 1998, $800,000; fiscal year 1999, $1,000,000 and $1,000,000; in 2000. A total of $3,800,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Each year the viticulture industry provides matching contributions in excess of the appropriated federal funds.

Mr. Skeen. Where is the work being carried out?

Response. Research is being carried out in 8 eastern states and California through 18 grants.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The research priorities set by the guidance group have not been met. The research is varied and complex and will take many years to complete.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project underwent merit review in January, 1999. The research proposals are peer-reviewed in both regions before selection. The review group is composed on industry, research, and extension personnel that are experts in viticulture.

WATER CONSERVATION, KANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the water conservation program grant.

Response. This research program is designed to develop and disseminate technical and economic information on the efficient use of water for irrigated crop production in western Kansas. The program has the following objectives:

1. Develop regression models to estimate the longevity of subsurface drip irrigation systems using calculations of annual system performance deterioration based on 13 years of operating pressures and flow rates;

2. Evaluate utilization of livestock effluent with subsurface drip irrigation and its effect on water redistribution and corn water use patterns;

3. Develop best management practices for nitrogen fertigation using subsurface drip irrigation systems for corn;

4. Estimate the long run economic impacts of irrigation efficiency improvements for irrigated corn, wheat, and grain sorghum in the farm sector and affiliated sectors of the High Plains economy;

5. Disseminate irrigation research information and best management practice recommendations to Kansas irrigators through a series of extension bulletins and updates based on research-based information.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The need to conserve water has focused attention on more efficient alternatives such as subsurface drip irrigation. This research will be of particular significance within the state and region. However, it also has national and international applications as advanced irrigation systems, such as subsurface drip irrigation, will be needed to improve irrigation water use efficiency in the next century. Economic research initiated in 1998 is examining the impact of adoption of improved water conservation techniques on the entire regional economy rather than just on the short term economics faced by the individual irrigator. This research will help society determine whether society should have a role in providing incentives to increase adoption rates of water conservation technology.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The research goal is to determine the feasibility of subsurface drip irrigation and other alternative irrigation systems in western Kansas to sustain irrigated corn production to support the beef feedlot industry. The project also supports an educational effort through collection and dissemination of information on efficient irrigation methods. Subsurface drip irrigation acreage is increasing in Kansas and farmers are obtaining results on their own farms.

The computer program Irrigation Economics Evaluation System --IEES--was distributed by the Kansas State University Cooperative Extension Service and is being used by Kansas irrigators. A report has been published which documents the data requirements and algorithms used in the model. A users guide is also available.

A report entitled "Economic Analysis of Alternative Irrigation Systems for Continuous Corn and Grain Sorghum in Western Kansas," has been completed. The results of this study indicate that a low drift nozzle, center pivot system is the most profitable center pivot system to use for irrigation of corn and grain sorghum. Overall, a surge flood system was the most profitable because of its relatively low ownership costs. Although the subsurface drip system shows some potential, it is only economically feasible when above-average crop yield and price conditions exist.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1993 with an appropriation of $94,000; $88,000 in fiscal year 1994; and $79,000 in fiscal years 1995-2000 each year. The total funds appropriated are $656,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal state of Kansas funds provided to this project were as follows: 1997, $119,659 state funds; 1998, $135,993 state funds; and 1999, $129,850 state funds.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted at Kansas State University. The field portion of the research is being conducted on Research Centers at Colby and Garden City, Kansas. Additional work is being carried out on campus at the Departments of Agronomy and Agricultural Economics in Manhattan, Kansas.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original anticipated completion date for the project was 1998. One of the most important objectives of the study is to evaluate longevity of the subsurface drip irrigation systems. These sites are unique to the region and very little information is available on system longevity. Pressing water quality problems of a regional and national scope has necessitated a change in the objectives to developing nutrient management practices under subsurface drip irrigation and utilization of livestock wastewater with subsurface drip irrigation. Additionally, changes in the federal farm program which allow greater planting flexibility has an effect on how irrigators make water/land allocation decisions. Field and economic studies related to allocation strategies, nutrient management, and wastewater utilization should be completed in three years. The projected completion date is 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project has been peer reviewed in January 2000. The reviewers felt the project concept to be valid and the timetable for accomplishments to be on target.

WEED CONTROL, NORTH DAKOTA

Mr. Skeen. Please provide a description of the research that has been funded under the Weed Control, North Dakota grant.

Respondent. A major focus has been developing and evaluating systems to reduce herbicide use in crop production. The experiments of longest duration are field evaluations of sustainable, reduced tillage and conventional crop rotation systems to ascertain changes in weed species and densities and in economic returns over time when weed management is reduced. Another emphasis has been weed biology, particularly understanding the unique physiological and genetic traits of herbicide-resistant kochia and wild oat in an effort to recommend the most cost-effective management alternatives. Another goal has been to improve the efficiency of postemergent herbicide use by utilizing additives that maximize weed control with reduced amounts of herbicide and by reducing spray volume and adapting new nozzle designs that improve application techniques.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The research address new methods to control weeds using systems control. The principles concerning effective use of additives with postemergent herbicides are being applied to improving the efficiency of postemergent herbicide use across the nation. Similarly, adaptation of herbicide application technology that allows reduced spray volumes while

sustaining herbicide effectiveness is of nationwide benefit. The increased understanding of the inheritance and management of herbicide resistance in kochia and wild oat will be beneficial to management of these weeds in the central and northern regions of the United States where these weeds are abundant and cause major losses annually. The long-term field experiments should provide useful information on the positive and negative impacts of reduced weed management systems wherever spring-sown small grains are the primary crop.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The initial major activity was a long-term series of experiments to evaluate changes in weed species and populations and the economic returns in conventional, sustainable and reduced tillage systems with rotations that are up to four years long. The research was initiated in 1993, but atypical wet conditions occurred for the first three years. It is felt that at least two complete cycles of crop rotations (eight years) will be necessary to accurately assess what farmers can expect from adopting new management systems.

The research to improve the efficiency of herbicides lead to development of the principle that effectiveness of many postemergent herbicides can be improved by using additives that dissolve the herbicide. This principle was utilized to develop a basic pH adjuvant that improves the effectiveness of several postemergent herbicides.

The research with genetics of herbicide-resistant kochia has determined that inbreeding depression occurs when this naturally cross-pollinated plant is self-pollinated to develop genetically uniform plants, which are desirable for many research objectives related to inheritance of genetic traits. However, this discovery also demonstrates that cross-pollination must be maintained in kochia for research intended to accurately simulate genetic changes and competition with crops that may occur in a field.

Resistance of wild oat to many of the major herbicides used for its control in the United States has been documented, including resistance to imazamethabenz which has not been reported previously. Molecular biology and physiological studies have been initiated to better understand the cause of imazamethabenz resistance in wild oat, so management strategies can be recommended. Initial research has demonstrated that weed control by herbicides applied to weeds of recommended size has been equally effective when spray-drift-reducing or conventional nozzles are used. Because drift-reducing nozzles produce large droplets, the next step of evaluation is being initiated to determine whether small weeds are treated and controlled effectively when drift-reducing nozzles are used.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through year 2000?

Response. The support by this grant began in fiscal year 1992 and appropriation for fiscal years 1992 and 1993 was $500,000 per year; $470,000 in fiscal year 1994; and $423,000 per year in fiscal years 1995 through 2000. A total of 4,008,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $27,030 state appropriations in 1992; $48,472 state appropriations in 1993; $41,969 state appropriations in 1994; $71,847 state appropriations in 1995; $62,134 state appropriations in 1996; $78,579 state appropriations in 1997; and an estimated $70,000 state appropriations in 1998 and 1999.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the North Dakota State University.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original completion date for the long-term rotation experiment, utilizing the conventional, reduced tillage and sustainable management systems, was anticipated to be a minimum of five years, but the experience with atypically environmental conditions suggest that 8 to 10 years will be necessary to attain a relatively steady state or logical end of the research. The current intent is to continue the research until at least 2002. The problems encountered due to the inbreeding depression in kochia suggests that it will be difficult to determine the true genetic nature of inheritance of herbicide resistance in this weed as quickly as projected. Due to the discovery of herbicide resistance of wild oat to imazamethabenz, the genetic and molecular biology research to characterize the nature of this resistance is just getting a good start. It is anticipated that the genetic and biology research with kochia and wild oat will need to continue until at least fiscal year 2002.

Mr. Skeen. When was the last Agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A scientific peer review of the written proposal was conducted in fiscal years 1998 and 1999 by CSREES prior to awarding the grant. Based on comments from the reviewers, CSREES is planning to conduct an onsite scientific peer review of this grant.

WETLAND PLANTS, LOUISIANA

Mr. Skeen. Please provide a description of the research that has been funded under the Wetland Plants, Louisiana, grant.

Response. CSREES has requested the university to submit a grant proposal that is currently in preparation.

Mr. Skeen. According to the principal researcher, what is the national, regional or local need for this research?

Response. There is local, regional, and national need for this research. Coastal wetlands erosion is a serious environmental problem in many coastal locations around the United States. The problem is particularly severe in Louisiana where an acre of coastal wetlands is lost to erosion every 20 minutes. Current technologies, even at great expense, can only slightly reduce these losses. The research this grant is funding has the potential to provide a significant improvement with respect to both the magnitude and expense of future coastal erosion control efforts.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to develop an economically-feasible approach to controlling coastal wetlands erosion that would utilize vegetation to retain areas threatened by erosion and to rebuild lost land. To accomplish this, a system that incorporates agricultural principles involved in crop production is required. Specifically, a seed-based system utilizing appropriate planting material is required. While last year was the first year of funding for this project from CSREES, progress has been rapid in developing this seed-based system, and field trials in the marsh were initiated in 1999.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1999, and the appropriation for fiscal years 1999 and 2000 was $600,000 per year for a total of $1,200,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $18,391 state appropriations, $5,319 industry grants, and $8,691 miscellaneous in 1999. In addition, the university had $110,081 in unrecovered indirect costs.

Mr. Skeen. Where is the work being carried out?

Response. Research is being conducted at the Louisiana Agricultural Experiment Station.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Since this is a new program, the original objectives have not yet been met.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This is a new project, and there has been no prior agency evaluation. An agency evaluation is planned for fiscal year 2000 following one year of project operation.

WHEAT GENETICS, KANSAS

Mr. Skeen. Please provide a description of the research that has been funded under the Wheat Genetics, Kansas grant.

Response. This project provides partial support for the Wheat Genetics Resource Center at the University of Kansas. The Center focuses on collection, evaluation, maintenance, and distribution of exotic wheat-related germplasm needed to develop new wheat cultivar resistant to disease, insects and environmental stress.

Mr. Skeen. According to the research proposal or the principal research, what is the national, regional or local need for this research?

Response. The principal researcher believes most cultivated varieties of wheat are derived from common sources. They lack the rich genetic diversity needed to develop resistance to diseases, insects, and environmental stress. The replacement of genetically-rich primitive cultivar and land races by modern, more uniform cultivars all over the world is causing erosion of wheat germplasm resources. New pests or those that have overcome varietal resistance pose a constant threat to the Nation's wheat production. Genetic resistance often resides in wild relatives of wheat. The researchers believe this program, which was established in Kansas, is providing service to wheat breeders nationally and internationally.

Mr. Skeen. What was the original goal of this research and what has been accomplished?

Response. The original goal of this research was to enhance the genetic diversity available to wheat breeders nationally and internationally by collecting, evaluating, maintaining, and distributing germplasm derived from wild relatives of wheat. To date, 39 germplasm releases have been made containing new genes for resistance to such pests as Hessian fly, greenbug, leaf rust, soil-borne mosaic virus and Russian wheat aphid. Germplasm stocks with resistance to leaf rust and powdery mildew are under development. Evaluation of germplasm for important resistance genes was carried out by Center scientists and cooperating institutions. Center scientists have introduced antifungal protein genes into the wheat plant to enhance its survival against pathogen attacks. One transgenic wheat line gave enhanced resistance to wheat scab, a devastating disease of wheat. In 1998, the Center filled 20 requests from U.S. wheat breeders for seed from the germplasm collection and 10 requests for seed of germplasm releases, as well as 34 requests from international breeders.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Work supported by this grant began in fiscal year 1989. Appropriations were for fiscal year 1989, $100,000; fiscal year 1990, $99,000; fiscal year 1991, $149,000; fiscal years 1992-1993, $159,000 per year; fiscal year 1994, $196,000; fiscal years 1995-1997, $176,000 each year, and $261,000 for fiscal years 1998, 1999, and 2000. A total of $2,173,000 has been appropriated.

Mr. Skeen. What is the source and amount of nonfederal funds provided by fiscal year?

Response. The nonfederal funds provided for this grant were as follows: $609,309 in 1991; $531,167 in 1992; and $730,082 in 1993, $468,960 in 1994; $563,671 in 1995; $457,840 in 1996; $495,820 in 1997; $155,279 in 1998 and $452,600 in 1999. Sources include state appropriations, product sales, and other organizations, such as state commodity associations.

Mr. Skeen. Where is this work being carried out?

Response. This research is being conducted at Kansas State University at the Wheat Genetics Resource Center. The principle investigator also reports collaborative projects with other departments at Kansas State University, as well as other institutions in the U.S.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The collection, evaluation, and enhancement of wheat germplasm is a continual process. Therefore, this project does not have a defined completion date. Some objectives related to germplasm evaluation have been completed in FY 1999 and other objectives which are related to other genetic sources are still in the developmental stage.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project was peer reviewed by the institution, Kansas Agricultural Experiment Station, and was found to address important issues in the winter wheat industry in Kansas and other states. The research has been productive based on germplasm releases and peer-reviewed journal articles and other publications. Additionally, each annual proposal is reviewed by an agency scientist.

WOOD UTILIZATION RESEARCH

Mr. Skeen. Please provide a description of the research that has been done under the wood utilization grant.

Response. The research includes: developing processes to upgrade wood products made from small-diameter or low quality trees to higher value structural applications; catalyzing the formation of new business enterprises; reducing environmental impact while improving systems for timber harvesting and fores products manufacturing; increasing the life of wood in use through preservation and good design; and assisting industry to be more innovative.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local need for this research?

Response. The forest products industry is very fragmented with many small firms which benefit from publicly-sponsored research. Research provides the woodworking machinery and tooling industry with the technology needed to be more competitive in the global economy. Most of the companies helped by this research are too small to afford in-house research groups. Shifts in resource availability and increased costs of the timber that is still available demand more complete utilization in order for wood to remain competitive.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to generate new knowledge that will benefit the wood industry and the environment. New scientists are trained. Consumers benefit from better and more environmentally-sound products. Among the major accomplishments of the eight centers are (1) design of glue-laminated beams that are reinforced with plastics to save 25-40 percent of the wood fiber that would otherwise be needed, (2) technology to apply wood preservatives using super fluids to reduce environmental problems associated with present commercial treatments, (3) better harvesting systems that are efficient and environmentally acceptable, (4) increase of wood machining speeds and reduction of saw blade width to increase productivity and save raw material, (5) a patented system to apply pressure and vibration to prevent enzymatic sapstain which degrades hardwood lumber by $70 to $200 million per year, (6) reduction of quantity of wood bleaching chemicals needed by wood pulp

producers, (7) design and strength of wood furniture frames to minimize wood requirements, (8) adoption of European frame saw technology to composite lumber to provide a new raw material source for industry, (9) improved technology to nondestructively scan standing trees for mechanical properties of the wood, (10) reduced warp in structural lumber produced from small-diameter trees, (11) characterization of the wood products industry, (12) heartwood formation, (13) recovery of preservatives from treated wood, (14) installation of a statistical process control system has been installed in one sawmill with impressive cost savings, and (15) development of cost effective and environmentally-friendly processes for removing high value chemicals from bark.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 1999?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1985, $3,000,000; fiscal years 1986 through 1989, $2,852,000 per year; fiscal year 1990, $2,816,000; fiscal years 1991 and 1992, $2,852,000 per year; fiscal year 1993, $4,153,000; fiscal year 1994, $4,176,000; fiscal years 1995 and 1996, $3,758,000 per year; fiscal years 1997 and 1998, $3,536,000 per year; fiscal year 1999, $5,136,000, which provided a half million increase for the six existing centers, and $1,000,000 for the two new centers; and $5,136,000 in fiscal year 2000, which provided $577,000 to establish a new center in Alaska. Total appropriations are $56,117,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The following are non-federal funds provided by state:

- - Mississippi State University non-federal funds were: State appropriations, $2,498,800, $2,178,725, $2,353,225, $2,331,691, $2,778,535, $2,582,617, $2,543,017, and $2,717,448 for 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, and 1999, respectively. In addition, industrial funds averaged $876,057 for the 5 years from 1995 to 1999 in support of the Mississippi Forest Products Laboratory.

- - Oregon State University state appropriations were: $1,337,962, $1,394,304, $1,256,750, $1,252,750, $1,417,755, $1,117,000, $1,100,000, $1,352,000, and $1,337,000 for 1991, 1992,1993, 1994, 1995, 1996, 1997, 1998, and 1999, respectively. Estimated non-public support was $731,000 this year.

- - Michigan State University non-federal contributions were $605,000, $590,000, and $700,000 for 1997, 1998, and 1999, respectively.

- - Three new locations were added in 1994: University of Minnesota-Duluth non-federal match was $590,000, $550,000, $560,000, $371,930, $307,532, and $510, 939 for 1994, 1995, 1996, 1997, 1998, and 1999, respectively.

- - North Carolina State University was $126,000, $165,000, $135,000, $163,216, $323,134, and $518,258 for 1994, 1995, 1996, 1997, 1998, and 1999, respectively.

- - University of Maine was $600,000, $445,723, $459,100, $477,464, $526,210, and $148,032 for 1994, 1995, 1996, 1997, 1998, and 1999, respectively.

- - Two new centers were added in 1999: The University of Tennessee non-federal funds for 1999 were $150,987. The consortium of the Universities of

Idaho and Montana and Washington State University non-federal funds for 1999 were $305,000.

Mr. Skeen. Where is the work being carried out?

Response. There are nine locations. The initial three---Oregon State University, Mississippi State University, and Michigan State University---were joined by the University of Minnesota-Duluth, North Carolina State University, and the University of Maine in fiscal year 1994. In 1999, they were joined by a center at the University of Tennessee, and a second center at the University of Idaho, which includes a consortium of Idaho, Montana, and Washington State. In 2000, funds for a wood utilization center in Alaska were appropriated. This center is just getting organized now.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objective was to build and maintain three strong regional centers of wood utilization research. These centers have been established, and six more centers have been added. Projects begun in 1999 will be completed by 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. On site reviews of centers are conducted on a rotating basis. Each center's plans are reviewed yearly or more frequently. Progress reports are reviewed yearly. Center directors met together for joint planning in June 1996 and in February 1999. Centers all have advisory committees or research committees which meet periodically. CSREES conducts informal on-site reviews periodically. The Minnesota and Oregon sites were visited in 1996, and the North Carolina site was visited in 1997. Oregon State was visited in 1998. A Departmental panel reviewed the original three centers in 1992 and 1993. At that time, the original objectives were broadened to address environmental concerns. The centers are helping industry meet environmental objectives by conducting research leading to sustained timber production; extending the timber supply through improved processing; developing new structural applications for wood; and developing wood extractives to substitute for pesticides, preservatives, and adhesives.

WOOL RESEARCH

Mr. Skeen. Please provide a description of the research that has been funded under the wool research grant.

Response. The overall goals for this research are to develop objective measures of wool, mohair, cashmere and other animal fibers to improve the quality of wool products while enhancing the profitability of the U.S. sheep and Angora goat industries. Specific objectives include: develop and evaluate measurement techniques for rapid objective evaluation of wool, mohair, cashmere and other animal fibers; increase the use of objective measurements to increase fiber production, quality and income to producers, and increase consumer acceptance of fabrics made from these fibers. The fiscal year 1999 grants terminate between August 2000 and June 2001. The 2000 grant proposals will soon be requested by the agency. All grants are reviewed for relevance to industry needs and undergo scientific peer review.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. Collaboration exists among researchers in Texas, Wyoming and Montana associated with this grant and other federal, university and industry scientists to assure responsiveness to the needs of those involved in wool and mohair production, marketing and processing. The sheep and goat industries and the principal researchers believe that this research to be of national, regional and local need. The research on wool, conducted by means of this grant, represents the only research efforts in the U.S. focused on improving the efficiency of measuring and assuring wool, mohair and cashmere quality for garments made from these fibers.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The overall goal for this research is to develop objective measures of wool, mohair, cashmere and other animal fibers with a focus on improving the efficiency of determining the quality of products made from these fibers while enhancing the profitability of the sheep and Angora goat industries. Research accomplishments included the development of rapid and inexpensive measurements of fiber diameter, distribution of animal fibers, and other fiber properties such as fiber length and color. Each of these properties are very important for grading and processing to determine ultimate softness, durability, dye characteristics, comfort, and garment price. Within the past year, evaluation of laser and near-infrared spectroscopy techniques have been completed by the three cooperators in this project in collaboration with Yocom-McColl Testing Labs, the main animal fiber testing lab in the United States. Two of the principal investigators authored an article in the American Society for Testing and Materials on standard methods of test for these instruments that are now in the final stages of acceptance by the Society, and therefore, the U.S. textile industry. In part, due to our efforts of this grant, all animal fibers tested for fiber diameter distribution by this commercial laboratory are now tested using one or the other of these new instruments. This has resulted in labor savings, thereby a reduction in the price for some associated fiber tests. Producers, traders, and processors now receive more accurate fiber data at reduced cost and with shorter turnaround times. Because this form of testing is also recognized by the international textile community, U.S. animal fibers are now more readily accepted and accessible as international commodities. Additional instruments, primarily for measuring length and strength, have also been evaluated with the ultimate objective of better describing domestic wool that will eventually permit electronic trading of animal fibers. These measurements impact the efficiency of the sheep and Angora goat industries, the effectiveness of monitoring the quality and consistency of imported products, and the satisfaction of buyers of wool, mohair and cashmere textiles. Other experiments aimed at enhancing our ability to establish the value of specialty animal fibers were successfully completed and reported for mohair, cashmere and other fibers. Experiments were also conducted to identify more productive rams and billie goats; to select for finer and more valuable mohair in Angora goats; to establish the genetic, nutrition, and management requirements for the concurrent production of lean lamb meat and high quality wool; and to demonstrate the economic advantages to producers of skirting and classing their raw wool prior to marketing. Research and education efforts have kept U.S. processors and producers current on the status of the wool markets world wide. It is important that the U.S. producers of wool, mohair, and cashmere are competitive in the world market and that consumers are assured high quality textiles.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Grants have been awarded from appropriated funds in the amount of $150,000 per year for fiscal years 1984-1985; $142,000 per year for fiscal years 1986-1989; $144,000 for fiscal year 1990; $198,000 for fiscal year 1991; and $250,000 per year for fiscal years 1992-1993; $235,000 for fiscal year 1994; $212,000 per year for fiscal years 1995-1997; and $300,000 per year for fiscal years 1998-2000. A total of $3,481,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $150,913 state appropriations, $11,800 product sales, $5,817 industry, and $3,556 miscellaneous in 1991; $111,394 state appropriations, $25,451 product sales, $41,442 industry contributions and $3,068 miscellaneous in 1992; $152,699 state appropriations, $39,443 product sales, $40,804 industry contributions and $3,556 miscellaneous in 1993; $150,094 state appropriations, $35,284 product sales, $36,484 industry contributions and $3,556 miscellaneous in 1994; $67,345 state appropriations, $10,000 product sales, and $34,325 industry contributions in 1995; $39,033 non-federal support in 1996; $174,486 non-federal support in 1997; $200,307 state appropriations and $13,000 industry contributions in 1998; and $202,854 state appropriations, $14,385 industry contributions, and $34,000 miscellaneous in 1999.

Mr. Skeen. Where is this work being carried out?

Response. The research is in progress at the Texas A&M University, Texas Agricultural Experiment Station at San Angelo, the University of Wyoming at Laramie, and Montana State University at Bozeman.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives? Response. The original objectives to improve the efficiency and profitability of wool, mohair and cashmere production and marketing are still valid and subject to further research. Specific objectives for individual laboratories and experiments are continually revised to reflect the changing research priorities for the wool, mohair, and cashmere industries and to satisfy consumer demands for products from these fibers. It is anticipated that current research will be completed by fiscal year 2005.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An external review of the overall wool research program was conducted in 1998 in Las Cruces, New Mexico by a team consisting of industry experts and peers from the scientific community. The review team concluded that the program was very productive and beneficial to the United States wool, mohair, and cashmere producers as well as the allied fiber industries. Research achievements, noted by the review team, included program input for testing methods and standards used to buy and sell wool for international trade.

In addition to the program review, grant proposals are annually reviewed and the research facilities are periodically visited. The principal investigators meet annually to evaluate progress and re-evaluate research

priorities according to industry needs. Because the research encompassed in this grant is a component of a regional research project, accomplishments are reported annually to scientific peers and representatives from the sheep, goat, wool, mohair, and cashmere industries. In addition, the overall regional research project is peer reviewed every third year.

SPECIAL RESEARCH GRANTS

Mr. Skeen. Please provide a summary table that shows by special research the following: title, need, goal, beginning year, target completion year, cumulative funding through fiscal year 1999, fiscal year 2000 funding, and linkages with other USDA or Federal agencies.

(The information follows.)

SUMMARY OF SPECIAL RESEARCH GRANTS

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Advanced Spatial Technologies, MS	L,R,N	To evaluate site specific technologies and develop recommendations related to fertilization, pest control, and other cultural practices.	1997	2004	2,150,000	1,000,000	NASA
Aflatoxin Research, IL	R	The reduction of infestation of corn with Aspergillus flavus and the consequent reduction of aflatoxin in corn produced.	1990	2002	$1,177,000	$113,000	ARS
Ag-Based Industrial Lubricants Research Program, IA	L,R,N	To develop a soybean-based hydraulic oil.	1998	Not reported	450,000	250,000	DOE, DOD
Agricultural Diversification and Specialty Crops, HI	L,R,N	To screen potential food and non-food crops for commercial development in Hawaii.	1988	2002	1,728,000	131,000	None
Agricultural Diversity/Red River, MN and ND	R	Vegetable growing, collection, storage, processing, and marketing.	1998	2001	500,000	250,000	RD, NASS
Agriculture Telecommunications, NY	N	To encourage the development and utilization of an agricultural telecommunications network to strengthen agricultural research, education, and extension.	2000	Not reported	--	425,000	None
Agriculture Water Usage, GA	R	To develop a monitoring and modeling strategy for water usage by agricultural irrigation.	1999	2004	300,000	300,000	NRCS
Alliance for Food Protection, NE and GA	L,R,N	To develop food processing and preservation technologies, and to develop techniques for detecting pathogens and their toxins.	1998	2000	1,200,000	300,000	None
Alternative Crops, ND	R,N	To introduce, evaluate, and test new crops.	1990	Not reported	5,841,000	550,000	None
Alternative Crops for Arid Lands, TX	R	To improve economic stability in the SW U.S. from arid and semi-arid lands.	1994	Not reported	449,000	100,000	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Alternative Salmon Products, AK	L,R,N	To develop market-desired salmon products using wild-caught salmon.	1998	2003	800,000	552,500	None
Animal Science Food Safety Consortium	L,R,N	To develop detection, monitoring, and prevention techniques to control infectious agents/chemical toxins in the food supply.	1989	Not reported	18,850,000	1,521,000	ARS, FSIS, ERS, OCRACBA FDA
Apple Fire Blight, MI and NY	L,R,N	To develop fire blight resistance varieties and disease management.	1997	2002	1,325,000	500,000	DOE, NSF ARS
Aquaculture, LA	L,R,N	To provide a basic and applied research base to address the needs of the aquaculture industry.	1992	2002	2,797,000	330,000	ARS, DOC
Aquaculture Research, Stoneville, MS	R	To address the needs of the catfish industry in the areas of water quality and nutrition.	1980	2002	9,637,000	592,000	ARS
Aquaculture, North Carolina	N	To address specific research needs of the domestic trout and hybrid striped bass industries.	1997	Not reported	150,000	255,000	ARS, DOC
Aquaculture, VA	L,R,N	To develop fish production culture methodologies and analyze economic management and marketing strategies.	1999	2002	100,000	100,000	ARS
Aquaculture Product and Marketing Development, WV	R,N	To develop marketing strategies and improve economic efficiency, quality, and variety of aquaculture products.	1998	2000	1,350,000	750,000	ARS, NASS, ERS
Babcock Institute for International Dairy Research and Development	N	To link the U.S. dairy industry with the world through training, education, technology transfer, and market analysis.	1992	2000	2,048,000	510,000	ARS, FAS AID
Biodiesel Research, MO	L	To examine the feasibility of producing biodiesel and other higher value products from oilseed crops.	1993	2000	951,000	152,000	AMS
Blocking Anhydrous Methamphetamine Production, IA	L,R	To discover a chemical procedure that will render anhydrous ammonia ineffective in producing methamphetamine.	2000	2003	--	212,500	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Bovine Tuberculosis, MI	L,R,N	To develop information about the spread of the bovine tuberculosis organism within the deer population.	2000	2002	--	170,000	APHIS
Brucellosis Vaccine, MT	L,R,N	To study the immune response of bison to Brucella abortus bacteria, and to develop an effective vaccine.	1999	2002	150,000	425,000	APHIS, NPS
Center for Animal Health and Productivity, PA	L,R,N	To reduce nutrient transfer to the environment surrounding dairy farms in the Chesapeake Bay watershed.	1993	2000	825,000	113,000	ARS
Center for Rural Studies, VT	L	To create a database and analytical capability for rural development programming in Vermont.	1992	2002	437,000	200,000	None
Chesapeake Bay Agroecology, MD	R	To understand nutrient cycling, retention, and utilization by vital agricultural industries in coastal regions of the Chesapeake Bay.	1999	Not reported	150,000	150,000	None
Chesapeake Bay Aquaculture, MD	R	To address problems limiting the expansion of the aquaculture industry in Maryland and the Mid-Atlantic Region.	1990	2002	3,957,000	385,000	ARS, DOC
Citrus Tristeza	L,R,N	To reduce losses in citrus through research, characterization, and detection.	1999	Not reported	500,000	595,000	ARS
Coastal Cultivars, GA	R	To improve rural income by identifying new crop cultivars for production in the southeastern U.S.	1997	2002	241,000	170,000	None
Competitiveness of Agriculture Products, WA	R	To improve opportunities for Pacific Northwest firms to export forest products and food products.	1992	2,001	5,740,000	680,000	FAS, FS AID, EPA
Cool Season Legume Research, ID and WA	R	To improve efficiency and sustainability of cool season food legumes through an integrated collaborative research program.	1991	2002	2,932,000	328,000	ARS
Cranberry and Blueberry, MA	L	To provide an integrated pest management approach to cranberry and blueberry production.	1999	Not reported	150,000	150,000	NIH, NSF

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Cranberry/Blueberry Disease and Breeding, NJ	L,R	To develop cranberry and blueberry cultivars compatible with new disease and production management strategies.	1985	Not reported	3,209,000	220,000	ARS
Critical Issues	N	To support research on critical issues related to new or emerging pests and diseases of animals and plants.	1998	Ongoing	800,000	200,000	None
Dairy and Meat Goat Research, TX	N	To conduct research that will lead to improvement in goat production among the small producers in the U.S.	1983	2001	1,269,000	63,000	None
Delta Rural Revitalization, MS	R	To involve applied research and outreach to create new and expanded economic development opportunities for the Mississippi Delta region.	1989	2000	1,777,000	148,000	None
Designing Foods for Health, TX	N	To design fruits and vegetables that assist in preventing diseases through diet.	1999	2001	250,000	318,750	DHHS
Diaprepes/Root Weevil, FL	L,R,N	To develop and deliver strategies to eliminate further spread of this pest and maintain viable plant health.	2000	Not reported	--	297,500	None
Drought Mitigation, NE	L,R,N	To create a National Drought Mitigation Center and develop a program aimed at lessening societal water shortages and vulnerability to drought.	1995	Not reported	1,000,000	200,000	NRCS, WAOB, FEMA
Ecosystems, AL	L,R	To develop a veterinary technician training program and integration of marine and estuary research into classrooms.	1998	Not reported	1,000,000	500,000	None
Environmental Research, NY	L,R,N	To identify impacts of nitrogen flow from agricultural lands and to investigate several interactions between agriculture and climate change.	1991	2000	4,417,000	400,000	EPA
Environmental Risk Factors, NY	N	To establish and maintain a database of critical evaluations on breast cancer risk for selected pesticides.	1997	2000	300,000	170,000	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Environmentally Safe Products, VT	N	To find alternative wood finishing products that are nontoxic and environmentally preferable.	2000	2003	--	170,000	None
Expanded Wheat Pasture, OK	L,N	To develop economically-viable management systems for use of wheat for supplemental pasture for beef cattle.	1989	2004	3,239,000	285,000	None
Expert IPM Decision Support System	L,R,N	To identify critical IPM needs of USDA, EPA, and the states such as the current and future availability of effective pest management options.	1994	Ongoing	1,076,000	177,000	NASS, EPA
Farm and Rural Business Finance, IL and AR	R,N	To assist farmers, ranchers, and rural businesses with research-based information on financial management.	1992	1999	860,000	87,000	None
Feed Barley for Rangeland Cattle, MT	N	To determine the true feed value of barley for feeder cattle, and improve the economic return to barley production.	1996	2010	1,950,000	637,500	None
Floriculture, HI	L	To develop tropical flower varieties with disease resistance and post-harvest handling practices and quarantine pest control.	1989	Not reported	3,012,000	250,000	ARS, ERS APHIS
Food and Agriculture Policy Institute, IA and MO	L,R,N	To conduct comprehensive analyses and disseminate results about the economic impacts of U.S. food, farm, and trade policies.	1984	Not reported	10,271,000	800,000	None
Food Irradiation, IA	L,R,N	To develop a research and technology transfer program leading to commercial use of irradiation of foods.	1991	Beyond 2000	1,800,000	200,000	None
Food Processing Center, NE	L	To assist small and mid-sized food processing companies to develop or improve processes and products.	1992	Beyond 2000	357,000	42,000	None
Food Marketing Policy Center, CT	N	To identify marketing problems and alternatives that improve the U.S. agricultural and food marketing economy.	1988	2003	4,084,000	400,000	AMS, ERS, GIPSA

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Food Quality, AK	L,R	To ensure a consistent and predictable level of handling and quality for Alaska seafood.	1999	2000	350,000	350,000	FSIS, FDA
Food Safety, AL	L,R,N	To develop a method of food inspection that involves the placement of a sensor chip on food items.	1999	Not reported	300,000	446,250	None
Food Systems Research Group, WI	N	To assess and evaluate the organization and performance of the U.S. food industry.	1976	2003	4,472,000	425,000	AMS
Forages for Advanced Livestock Production, KY	L,R	To provide improved forages/livestock management systems for Kentucky and adjacent areas.	2000	2004	--	212,500	None
Forestry Research, AR	R,N	To develop alternative forest management strategies for achieving multi-resource objectives.	1994	Beyond 2000	3,085,000	523,000	FS, NRCS
Fruit and Vegetable Market Analysis, AZ and MO	N	To assess and evaluate public policies and programs impacting the U.S. fruit and vegetable industry.	1994	Not reported	1,833,000	320,000	RMA, RBCS, AMS, FAS
Generic Commodity Promotion, NY	L,R,N	To determine the economic effectiveness of generic promotion programs.	1994	2002	1,295,000	198,000	None
Global Change	L,R,N	To provide accurate, geographically-dispersed data on UV-B radiation reaching the surface of the earth.	1992	Ongoing	11,982,000	1,000,000	NOAA, NIST DOE, NASA, EPA, NSF, SI
Global Marketing Support Services, AR	N	To develop a university research service organization to support international trade development activities.	1994	2001	577,000	127,000	None
Grain Sorghum, KS	L,R	To identify germplasm and use it to develop grain sorghum cultivars that mature early and produce more grain.	1997	2006	318,000	106,000	None
Grass Seed Croppings Systems for Sustainable Agriculture, ID, OR, and WA	N	To develop grass seed production systems that do not depend on field burning of straw residue.	1994	2004	2,585,000	423,000	ARS

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Human Nutrition, IA	R	To improve animal and plant food fat content in the human food supply.	1991	2001	4,135,000	473,000	DHHS
Human Nutrition, LA	N	To identify the basis for the susceptibility to obesity of some people who eat high fat diets.	1991	2001	6,912,000	752,000	DHHS
Human Nutrition, NY	N	To evaluate and implement the increased reliance on plant-based foods that is at the core of current dietary guidelines.	1989	2001	6,833,000	622,000	FNS, ARS, DHHS, CDC
Hydroponic Tomato Production/ Germplasm Development in Forage Grasses, OH	L	To develop and evaluate management protocols for economic production of green house tomatoes as an alternative crop.	1998	2004	340,000	200,000	None
Illinois-Missouri Alliance for Biotechnology	R,N	To develop a program in agricultural biotechnology for research in areas of need related to corn and soybeans.	1995	2000	6,398,000	1,184,000	ARS
Improved Dairy Management Practices, PA	L	To identify and implement profit-enhancing management strategies for Pennsylvania dairy farms.	1992	2002	2,478,000	296,000	ARS
Improved Early Detection of Crop Disease, NC	L,R,N	To produce a crop-based biosensor platform with which to monitor the onset and spread of disease for the purpose of early intervention.	2000	Not reported	--	170,000	None
Improved Fruit Practices, MI	L	To develop and maintain/expand Michigan's fruit and small fruits industry.	1994	2004	2,719,000	445,000	None
Infectious Disease Research, CO	N	To provide valid risk assessment models for diseases which affect international trade and animal and public health.	1999	2003	250,000	255,000	APHIS, ARS
Institute for Food Science and Engineering, AR	R	To facilitate and encourage value-added research and improve the processing of agricultural products.	1996	2002	3,700,000	1,250,000	None
Integrated Pest Management	N	To provide farmers with new pest management options to replace those at risk of being outmoded by FQPA.	1981	Ongoing	58,130,000	2,731,000	NASS, OPMP, ARS, APHIS, FS, ERS, EPA

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Integrated Production Systems, OK	L	To develop new and alternative crops to supplement and diversify the cow/ calf livestock agriculture.	1984	2002	3,010,000	180,000	None
International Agricultural Market Structures and Institutions, KY	N	To increase the international marketing success of American farmers and agribusinesses.	1999	2003	250,000	250,000	None
International Arid Lands Consortium	R,N	To develop an ecological approach to multiple-use management and sustainable use of arid and semi-arid lands.	1994	2001	2,045,000	400,000	FS
Iowa Biotechnology Consortium	N	To enhance the recovery and utilization of by-product materials arising from industries using biotechnology.	1989	Not reported	18,857,000	1,564,000	EPA, NIH
IR-4 Minor Crop Pest Management	L,R,N	IR-4 is the principal public effort supporting the registration of pesticides and biological pest control agents for the minor crop industry. This need is further prompted by the more stringent regulatory requirements under FQPA.	1975	Ongoing	70,509,000	8,990,000	ARS
Jointed Goatgrass	R,N	To reduce jointed goatgrass on winter wheat production and quality.	1994	2005	1,923,000	360,000	ARS
Livestock and Dairy Policy, NY and TX	L,R,N	To assess economic impacts on the U.S. livestock and dairy sectors.	1989	Not reported	5,292,000	475,000	None
Lowbush Blueberry Research, ME	L,R,N	To provide answers to unique lowbush blueberry production, pest, and processing problems.	1990	2001	2,050,000	220,000	NOAA, NSF, ARS
Maple Research, VT	L,R	To conduct research on maple tree physiology, management of maple stands, and related aspects of the maple syrup industry.	1985	2002	1,431,000	100,000	None
Meadowfoam, OR	L,R,N	To increase the productivity of meadowfoam as an oilseed crop for U.S. farmers.	1999	2001	300,000	300,000	ARS
Michigan Biotechnology Consortium	L,R,N	To develop bioprocessing technologies to manufacture products from agricultural raw materials.	1989	Not reported	17,934,000	675,000	ARS, EPA, NSF

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Midwest Advanced Food Manufacturing Alliance, NE	L,R,N	To develop new manufacturing and processing technologies for food and related products from crops and livestock.	1994	Not reported	2,585,000	423,000	None
Midwest Agricultural Products, IA	L,R,N	To enhance the exports of agricultural commodities, value-added products, and equipment produced by agribusinesses.	1992	2002	5,018,000	592,000	None
Milk Safety, PA	L,R,N	To minimize or eliminate future foodborne disease outbreaks from milk and dairy products.	1986	2000	3,762,000	297,500	None
Minor Use Animal Drugs	L,R,N	To obtain approval by the FDA for animal drugs intended for use in minor species and for minor uses in major species.	1982	Ongoing	6,841,000	550,000	ARS, FDA, DOI
Molluscan Shellfish, OR	R,N	To establish a germplasm repository for genetic improvement of cultured shellfish stocks.	1995	2002	1,750,000	400,000	ARS, DOC
Multi-Commodity Research, OR	L,R,N	To provide agricultural market research and analysis to support Pacific Northwest producers and agribusiness.	1993	2001	2,402,000	364,000	None
Multi-Cropping Strategies for Aquaculture, HI	L	To develop technology for the co-production of shrimp and oysters in aquacultural productions systems.	1987	2002	1,832,000	127,000	DOC, RD
National Biological Impact Assessment Program	N	To support the environmentally-responsible use of biotechnology products to benefit agriculture and the environment.	1989	Ongoing	2,700,000	254,000	ARS, APHIS, EPA
Nematode Resistance Genetic Engineering, NM	R,N	To provide an alternative approach for the control of plant parasitic nematodes.	1991	2001	1,226,000	127,000	None
Nevada Arid Rangelands Initiative, NV	L	To develop management systems to protect Nevada's arid rangeland from invasive weeds and wildfires.	2000	2005	--	255,000	None
New Crop Opportunities, AK	L	To address the feasibility of growing wild rice as an alternative crop in Alaska.	2000	2003	--	425,000	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
New Crop Opportunities, KY	R	To offer new opportunities for crop diversification, technology transfer, and demonstrations.	2000	2003	--	595,000	None
Nonfood Agricultural Products Program, NE	R	To identify market niches for industrial utilization of agricultural products.	1990	Not reported	891,000	64,000	None
Oil Resources from Desert Plants, NM	L,R,N	To transfer the oil producing capability of jojoba and other native shrubs into higher yielding crops.	1989	2004	1,899,000	175,000	None
Organic Waste Utilization, NM	L,R,N	To determine the feasibility of simultaneously composting dairy waste from agriculture and industry.	1996	2001	450,000	100,000	DOE
Pasture and Forage Research, UT	L	To develop profitable and sustainable pasture and forage management systems.	1997	2002	650,000	225,000	None
Peanut Allergy Reduction, AL	L,R,N	To reduce allergenic potential of peanuts and develop vaccines and better marketing, handling, and processing methods to reduce allergy risks.	2000	Not reported	--	425,000	NIH
Peachtree Shortlife, SC	R	To evaluate the longevity and productivity of Guardian rootstocks at sites in the SE.	1981	2001	3,365,000	162,000	None
Pest Control Alternatives, SC	R,N	To provide growers with alternatives for managing pests in vegetable crops as substitutes for chemical sprays.	1992	Not reported	898,000	106,000	ARS
Pest Management Alternatives	L,R,N	To support projects that help farmers respond to the environmental and regulatory issues confronting pesticide availability in agriculture.	1996	Ongoing	6,492,000	1,623,000	OPMP, EPA
Phytophthora Root Rot, NM	L,R	To improve chile production through genetically-superior cultivars with new improved cultural practices.	1991	2002	1,201,000	127,000	NSF
Plant, Drought, and Disease Resistance Gene Cataloging, NM	L,R,N	To improve plants resistant to drought an disease for New Mexico and U.S. crops.	1998	2003	300,000	212,500	NIH
Potato Research	L,R,N	To improve potato production through genetics and cultural practices.	1983	Beyond 2000	17,952,000	1,300,000	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Precision Agriculture, KY	L,R,N	To evaluate site specified technologies and develop recommendations for their use in crop management systems.	1999	2003	500,000	850,000	None
Pre-harvest Food Safety, KS	L,R,N	To determine the incidence of E. coli in large vs small beef cow-calf operations.	1998	Beyond 2000	848,000	212,000	None
Preservation and Processing Research, OK	L	To support technological improvements in fruit, nut, and vegetable handling systems.	1985	2002	3,477,000	226,000	None
Rangeland Ecosystems, NM	R	To address the ecology of noxious and invasive weeds that are endemic to New Mexico's rangelands.	1989	2004	1,884,000	200,000	None
Red Snapper Research, AL	R	To restore native populations and stimulate the development of aquaculture enterprises in the Gulf Region.	2000	2001	--	510,000	ARS, DOC
Regional Barley Gene Mapping Project	N	To construct a medium resolution barley genome map and to identify and locate loci.	1990	Beyond 2000	3,418,000	425,000	None
Regionalized Implications of Farm Programs, TX and MO	N	To provide the farm community and agribusinesses information about farm, trade, and fiscal policy implications.	1990	Not reported	3,187,000	294,000	None
Rice Modeling, AR and MO	L,R,N	To develop a rice industry model in analyzing the impact of changes in domestic and foreign public policies.	1998	2005	1,382,000	286,000	None
Rural Development Centers	R	To strengthen rural families, communities, and businesses by socio-economic research and extension.	1971	Ongoing	10,641,000	523,000	ERS, RD, NRCS, FS, FAS, EPA DHHS, SBA, TVA, DOC, ARC
Rural Policies Institute, IA, MO, and NE	L,R,N	To provide a comprehensive approach to rural policy analysis.	1991	2002	5,306,000	644,000	ERS, RD, DHHS
Russian Wheat Aphid, CO	R	To discover and control new crop genes which provide resistance to the Russian Wheat Aphid.	1998	2003	400,000	200,000	ARS, APHIS, NASS, FAS
Seafood Harvesting, Processing, and Marketing, AK	L,R,N	To improve/develop technologies in seafood harvesting, processing, product development, and marketing in Alaska.	2000	Not reported	--	552,500	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Seafood Harvesting, Processing, and Marketing, MS	L,R,N	To improve the quality and safety of catfish.	1990	Not reported	3,315,000	305,000	None
Seafood Safety, MA	L,R	To address and solve priority seafood safety issues critical to assuring public health.	2000	2002	--	255,000	None
Small Fruit Research, ID, OR, and WA	R	To enhance the production and quality of small fruits in the Pacific Northwest.	1991	Not reported	1,882,000	300,000	ARS
Southwest Consortium for Plant Genetics and Water Resources	L,R,N	To provide solutions for arid and semi-arid crop adaptation.	1986	2001	5,086,000	338,000	None
Soybean Cyst Nematode, MO	R,N	To develop new resistant soybean varieties through various management strategies.	1979	2000	6,430,000	475,000	ARS
STEEP III - Water Quality in the Pacific Northwest	R	To meet the needs of farmers and ranchers in the Pacific Northwest in solving severe problems with soil erosion and water quality.	1991	2000	6,690,000	500,000	ARS, NRCS, EPA, USGS
Sustainable Agriculture, CA	L,R.N	To develop economically-viable and environmentally-sound production sytems for strawberries and vegetables.	2000	Not reported	--	255,000	None
Sustainable Agriculture, MI	L	To develop agricultural production sytems that are highly productive, profitable, and environmentally sound.	1994	2001	2,719,000	445,000	None
Sustainable Agriculture Systems, NE	L,R	To integrate sustainable agriculture systems to meet production, economic, and environmental quality goals.	1992	2002	501,000	59,000	None
Sustainable and Natural Resources, PA	R,N	To study the cycling of nutrients in soil and crops on the development of indices for measurement of soil health.	1993	2000	665,000	95,000	None
Sustainable Beef Supply, MT	N	To develop and conduct educational programs on attaining beef quality assurance standards.	1999	2003	500,000	637,500	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Sustainable Pest Management for Dryland Wheat, MT	R	To investigate the physical, chemical, and biological interactions of cropping sequences and tillage systems.	1997	Beyond 2000	1,000,000	425,000	ERS, ARS NRCS
Swine Waste Management, NC	L,R,N	To develop a prototype system for the treatment of animal waste.	1997	2001	1,015,000	500,000	ARS, EPA
Tillage, Silviculture, and Waste Management, LA	R	To improve conservation tillage in rice and cotton farming.	1994	2001	1,295,000	212,000	None
Tomato Wilt Virus, GA	L,R	To reduce losses in the major crops grown in the southeastern states due to spotted wilt.	1999	2001	200,000	200,000	AID
Tropical Aquaculture, FL	L,R,N	To reduce the trade deficit on the import of ornamental fish.	2000	2001	--	170,000	None
Tropical and Subtropical Research	L,R,N	To improve the agricultural productivity of many of the subtropical and tropical parts of the U.S.	1983	Not reported	51,994,000	2,724,000	None
Turkey Coronavirus, IN	N	To develop enzyme-linked immuno-sorbent assays for monitoring antibody to turkey coronavirus and turkey coronavirus antigent in turkey flocks.	1999	2001	200,000	200,000	None
Urban Pests, GA	R	To better understand the biology of subterranean termites and their responses to selected environmental cues.	1991	Not reported	619,000	64,000	FS, ACOE
Vidalia Onions, GA	L,R,N	To improve onion quality and enhance competitiveness of the product.	1998	Beyond 2000	184,000	100,000	ARS
Viticulture Consortium, NY and CA	N	To maintain or enhance the competitiveness of the U.S. viticulture and wine industry in the global market.	1996	Beyond 2000	2,800,000	1,000,000	None
Water Conservation, KS	L,R	To determine the feasibility of subsurface drip irrigation and other sytems to sustain irrigated corn production to support the beef feedlot industry.	1993	2002	577,000	79,000	FAS, FS, EPA, AID
Weed Control, ND	R	To develop and evaluate systems to reduce herbicide use in crop production.	1992	2002	3,585,000	423,000	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	Linkages b/
Wetlands Plants, LA	L,R,N	To develop an economically-feasible approach to controlling coastal wetlands erosion.	1999	Not reported	600,000	600,000	EPA
Wheat Genetics, KS	N	To enhance the genetic diversity available to wheat breeders nationally and internationally.	1989	Not reported	1,912,000	261,000	None
Wood Utilization Research	L,R,N	To provide the woodworking machinery and tooling industry with the technology needed to be more competitive in the global economy.	1985	2003	50,981,000	5,136,000	FS, EPA, DOD, DOT, NSF DOE, TVA
Wool Research, MT, TX, and WY	L,R,N	To develop objective measures of wool, mohair, cashmere, and other animal fibers to improve the quality of wool products.	1984	2005	3,181,000	300,000	ARS, AMS

a/ Local (L), Regional (R), and National (N)

b/ USDA agencies:
AMS-Agricultural Marketing Service
APHIS-Animal and Plant Health Inspection Service
ARS-Agricultural Research Service
ERS-Economic Research Service
FAS-Foreign Agricultural Service
FSIS-Food Safety and Inspection Service
FS-Forest Service
GIPSA-Grain Inspection, Packers & Stockyards Administration
NASS-National Agricultural Statistics Service
NRCS-Natural Resources Conservation Service
ORACBA-Office of Risk Assessment and Cost-Benefit Analysis
OPMP-Office of Pest Management Policy
RMA-Risk Management Agency
RBCS-Rural Business-Cooperative Service
RD-Rural Development
WAOB-World Agricultural Outlook Board

Other Federal agencies:
AID-Agency for International Development
ARC-Appalachian Regional Commission
ACOE-Army Corps of Engineers
CDC-Centers for Disease Control
DHHS-Department of Health and Human Services
DOE-Department of Energy
DOC-Department of Commerce
DOD-Department of Defense
DOI-Department of Interior
DOT-Department of Transportation
EPA-Environmental Protection Agency
FDA-Food and Drug Administration
FEMA-Federal Emergency Management Agency
NASA-National Aeronautics and Space Administration
NIH-National Institutes of Health
NIST-National Institute of Standards and Technology
NOAA-National Oceanic and Atmospheric Administration
NPS-National Park Service
NSF-National Science Foundation
SBA-Small Business Administration
SI-Smithsonian Institutution
USGS-U.S. Geological Survey
TVA-Tennessee Valley Authority

COMPETITIVE GRANTS

Mr. Skeen. For the record, please provide a breakdown into the smaller subsets of research for each of the NRI components for 1999.

(The information follows.)

National Research Initiative Competitive Grants Program

Program	FY 1999
Natural Resources and the Environment	
Improved Utilization of Wood/Wood Fiber	2,561,018
Forest/Range/Crop/Aquatic Ecosystems	4,871,500
Plant Responses to the Environment	2,094,805
Soils & Soil Biology	4,257,500
Terrestrial Ecology and Global change -	0
Water Resources Assessment/Protection	4,420,500
Subtotal	18,205,323
Nutrition, Food Quality and Health	
Ensuring Food Safety	4,061,942
Epidemiological Approaches for Food Safety	5,312,072
Improving Human Nutrition	4,620,554
Subtotal	13,994,568
Animals	
Enhancing Reproductive Efficiency	4,554,818
Identify Genetic Mechanisms/Gene Mapping	6,076,755
Improving Animal Growth and Development	3,226,346
Sustaining Animal Health and Well-Being	11,118,576
Subtotal	24,976,495
Plants	
Biologically Based Pest Management	2,310,675
Entomology and Nematology	6,395,000
Nitrogen Fixation/Metabolism	2,300,000
Photosynthesis and Respiration	1,977,356
Plant Genetic Mechanisms	4,518,500
Plant Genome	4,324,913
Plant Growth and Development	5,508,000
Plant Pathology	5,017,815
Rice Genome	2,000,000
Weed Biology and Management	1,312,188
Subtotal	35,664,447
Markets, Trade and Policy	
Markets and Trade	1,989,909

Rural Development	1,700,000
Subtotal	3,689,909
Enhancing Value and Use of Agricultural and forest Products	
Food Character./Process/Product Research	3,764,541
Non-Food Character./Process/Product Research	2,344,605
Subtotal	6,109,146
OTHER	
Agricultural Systems	3,507,366
Strengthening Programs	3,426,535
Subtotal	6,933,901
Interagency - Arabidopsis Thaliana Genome	100,000
Awards to be determined	880,713
Subtotal Grants	110,554,502
Federal Administration,	4,772,000
Small Business	2,863,200
Biotechnology Innovation Research Risk Assessment	231,850
Peer Panel	878,448
TOTAL	119,300,000

1890 INSTITUTIONS AND TUSKEGEE UNIVERSITY

Mr. Skeen. Please update the table, which appears on page 1636 of last year's hearing record, which shows the total funds available to the 1890 Institutions and Tuskegee University.

(The information follows.)

1890 INSTITUTIONS AND TUSKEGEE UNIVERSITY FUNDING

	1999 Actual	2000 Estimate	2001 Estimate
Research and Education Activities:			
Evans-Allen formula	28.8	29.7	29.7
Capacity Building Grants	9.2	9.2	9.5
Other Programs, Grants to 1890 Institutions and Tuskegee University	0.7	0.7	0.6 a/
Subtotal, Research and Education Activities	38.7	39.6	39.8
Extension Activities:			
Formula Payments for Extension	24.8	25.8	26.8
Facilities Grants	7.1	13.8 b/	11.5
Other Programs, Grants to 1890 Institutions and Tuskegee Tuskegee University	0.2	0.1	0.1
Subtotal, Extension Activities	32.1	39.7	38.4
Total, CSREES	70.8	79.3	78.1
Other Agencies:			
Cooperative Research, Support of Agency Programs, Student Assistance and Recruiting	16.4	16.3	16.3
TOTAL, Program Funds	87.2	95.6	94.5

a/ Amount reduced because there is no funding for Special Research Grants in FY 2001.

b/ Includes fiscal year 1999 carry over funds.

1890 CAPACITY BUILDING GRANTS

Mr. Skeen. Please list for the record the capacity building grants that were awarded in fiscal years 1998 and 1999, and the planned amounts for fiscal years 2000 and 2001.

(The information follows.)

1890 CAPACITY BUILDING GRANTS

Research Capacity Building Grants	Fiscal Year 1998 Actual	Fiscal Year 1999 Actual	Fiscal Year 2000 Estimate	Fiscal Year 2001 Estimate
Alabama A&M University	--	453,728	--	--
Tuskegee University, Alabama	194,288	397,909	--	--
University of Arkansas, Pine Buff	269,988	--	--	--
Florida A&M University	526,699	--	--	--
Fort Valley State College, Georgia	269,986	755,917	--	--
Kentucky State University	452,448	253,243	--	--
Southern University, Louisiana	181,411	281,142	--	--
University of Maryland, Eastern Shore	538,933	299,024	--	--
Alcorn State University, Mississippi	279,785	156,836	--	--
Langston University, Oklahoma	538,733	680,000	--	--
South Carolina State University	--	161,792	--	--
Tennessee State University	808,894	549,645	--	--
Virginia State University	268,943	266,645	--	--
Subtotal, Research Grants	4,330,108	4,255,881	4,299,325 *	4,446,000
Teaching Capacity Building Grants				
Alabama A&M University	179,843	358,382	--	--
Tuskegee University, Alabama	517,690	359,538	--	--
University of Arkansas, Pine Buff	156,091	197,475	--	--

Teaching Capacity Building Grants	Fiscal Year 1998 Actual	Fiscal Year 1999 Actual	Fiscal Year 2000 Estimate	Fiscal Year 2001 Estimate
Delaware State University	180,000	179,100	--	--
Florida A&M University	353,301	198,988	--	--
Fort Valley State College, Georgia	559,244	89,408	--	--
Kentucky State University	180,000	177,010	--	--
Southern University, Louisiana	373,443	355,374	--	--
Universisty of Maryland, Eastern Shore	341,067	179,860	--	--
Alcorn State University, Mississippi	--	340,458	--	--
Lincoln University, Missouri	--	153,905	--	--
North Carolina A&T State University	532,782	703,967	--	--
Langston University, Oklahoma	--	180,000	--	--
South Carolina State University	--	333,856	--	--
Tennessee State University	--	199,000	--	--
Prairie View A&M University	712,433	180,000	--	--
Virginia State University	355,764	179,959	--	--
Subtotal, Teaching Grants	4,441,658	4,366,280	4,416,000	4,560,000
Subtotal, Research and Teaching Grants	8,771,766	8,622,161	8,715,325	9,006,000
Federal Administration	276,000	368,000	368,000	380,000
Small Business Act	111,550	110,400	110,400	114,000
Biotechnology Risk Assessment	--	--	6,275	--
Peer Panel Costs	39,342	38,281	--	--
Food and Agriculture Education Information System (FAEIS)	--	52,500	--	--
Higher Education Program Teaching Awards	--	12,000		
Funds carried forward to FY 1999	1,342	--	--	--
	9,200,000	9,201,342	9,200,000	9,500,000

* The 1890 Capacity building grants are awarded competitively. The fiscal year 2000 awards will be announced around the middle of July.

CAPACITY BUILDING GRANTS PROGRAM

Mr. Skeen. Please provide a listing of schools and amounts received in the past 12 months that matched Federal Funds.

Response. Under the 1890 Institution Capacity Building Grants Program, matching is strongly encouraged but not required. Of the seventeen 1890 land-grant institutions that received Capacity Grant awards in fiscal year 1999, four schools matched $2,016,178 in Federal funds received with $256,190 in non-Federal matching funds to support teaching and research capacity building projects. A table follows:

	Number of Grants Awarded*	Federal Funds Awarded*	Non-Federal Matching Funds
Alcorn State University	3	$ 497,294	$ 82,459
Langston University	4	860,000	116,082
University of Maryland, ES	2	478,884	21,000
Prairie View A&M University	1	180,000	36,649
		2,016,178	256,190

*In fiscal year, the funding limitation per 1890 institution was $860,000, and one school could receive up to four grant awards.

ANIMAL HEALTH AND DISEASE RESEARCH

Mr. Skeen. Last year you reported that you would not be able to provide the number and average costs of grants made with $5,109,000 for the Animal Health and Disease (Sec. 1433) program until after September 30, 1999. Please provide that information now.

(The information follows.)

ANIMAL HEALTH AND DISEASE RESEARCH

FY 1999 Distribution of Funds

Institution	FY 1999 Section 1433 Formula Funds
Auburn University, Agricultural Experiment Station	$52,406
Auburn University, School of Veterinary Medicine	48,412
Tuskegee University, School of Veterinary Medicine	9,841
University of Alaska, Agricultural Experiment Station	5,670
University of Arizona, Agricultural Experiment Station	44,820
University of Arkansas, Agricultural Experiment Station	103,195
University of California, Oakland, Agricultural Experiment Station	131,342
University of California, Davis, School of Veterinary Medicine	406,248
Colorado State University, Agricultural Experiment Station and College of Veterinary Medicine	210,815
University of Connecticut, Storrs, Agricultural Experiment Station	23,061
University of Delaware, Agricultural Experiment Station	28,878
University of Florida, Agricultural Experiment Station	80,964
University of Florida, College of Veterinary Medicine	32,590
University of Georgia, Agricultural Experiment Station	12,264
University of Georgia, College of Veterinary Medicine	119,804
University of Hawaii, Agricultural Experiment Station	3,371
University of Idaho, Agricultural Experiment Station	50,456
University of Illinois, Agricultural Experiment Station and College of Veterinary Medicine	151,168
Purdue University, Agricultural Experiment Station and College of Veterinary Medicine	100,108
Iowa State University, Agricultural and Home Economics Experiment Station	43,730
Iowa State University, College of Veterinary Medicine	148,993
Kansas State University, Agricultural Experiment Station and College of Veterinary Medicine	146,961
University of Kentucky, Agricultural Experiment Station	65,538
Louisiana State University, Agricultural Experiment Station	50,049
Louisiana State University, College of Veterinary Medicine	43,345
University of Maine, Agricultural Experiment Station	17,296
University of Maryland, Agricultural Experiment Station	27,543
University of Massachusetts, Agricultural Experiment Station	6,944
Tufts University, School of Veterinary Medicine	5,647
Michigan State University, Agricultural Experiment Station and College of Veterinary Medicine	80,494
University of Minnesota, Agricultural Experiment Station	64,051
University of Minneosta, College of Veterinary Medicine	90,980
Mississippi State University, Agricultural and Forestry Experiment Station and College of Veterinary Medicine	94,240
University of Missouri, Agricultural Experiment Station	54,198
University of Missouri, College of Veterinary Medicine	105,293
Montana State University, Agricultural Experiment Station	54,399
University of Nebraska, Agricultural Experiment Station	147,736
University of Nevada, Agricultural Experiment Station	8,634
University of New Hampshire, Agricultural Experiment Station	7,209
Rutgers University, Agricultural Experiment Station	18,669
New Mexico State University, Agricultural Experiment Station	33,447
Cornell University, Agricultural Experiment Station	37,400
Cornell University, College of Veterinary Medicine	171,548

Institution	FY 1999 Section 1433 Formula Funds
North Carolina State University, Agricultural Experiment Station	47,874
North Carolina State University, College of Veterinary Medicine	98,577
North Dakota State University, Agricultural Experiment Station	35,981
Ohio State University, Agricultural Research and Development Center	55,004
Ohio State University, College of Veterinary Medicine	28,425
Oklahoma State University, Agricultural Experiment Station and College of Veterinary Medicine	128,302
Oregon State University, Agricultural Experiment Station	88,418
Oregon State University, College of Veterinary Medicine	8,445
Pennsylvania State University, Agricultural Experiment Station	55,849
University of Pennsylvania, College of Veterinary Medicine	94,455
University of Puerto Rico, Agricultural Experiment Station	10,756
University of Rhode Island, Agricultural Experiment Station	2,349
Clemson University, Agricultural Experiment Station	20,825
South Dakota State University, Agricultural Experiment Station	78,715
University of Tennessee, Agricultural Experiment Station	43,439
University of Tennessee, College of Veterinary Medicine	18,218
Texas A&M University, Agricultural Experiment Station and College of Veterinary Medicine	350,916
Utah State University, Agricultural Experiment Station	39,878
University of Vermont, Agricultural Experiment Station	15,689
Virginia Polytechnic Institute, Agricultural Experiment Station and College of Veterinary Medicine	78,261
Washington State University, Agricultural Experiment Station	12,043
Washington State University, College of Veterinary Medicine	127,097
West Virginia State University, Agricultural and Forestry Experiment Station	9,952
University of Wisconsin, Agricultural Experiment and College of Veterinary Medicine	151,347
University of Wyoming, Agricultural Experiment Station	28,942
Total Payments to States	1,581,883
Small Business Set-Aside	122,616
Federal Administration	204,360
Biotech. Risk Assessment	12,510
Total Appropriation	1,921,369

ANIMAL HEALTH AND DISEASE RESEARCH

Mr. Skeen. Please provide some specific examples of work accomplished with these grant funds.

Response. Examples of research outcomes supported with Sec. 1433 funding include the following:

In the state of Iowa, a potential new treatment for cryptosporidiosis in animals and humans has been developed and is undergoing further development and testing for effectiveness. A synthetic substance, which serves as an antagonist for neurokinin substance P, has beneficial effects against cryptosporidiosis in a mouse model. This finding will lead to development of new immune system modulators to treat this disease.

In Indiana, research has resulted in demonstrating the effectiveness of oral administration of DNA vaccines in animals. The DNA vaccine is encapsulated in alginate microspheres and then fed to the animals. There was a very good immune response using this technique in mice and work is now proceeding to evaluate the method for use in food animals.

In Indiana, an antibody-capture enzyme-linked immunosorbent assay, ELISA, has been developed for detecting antibodies to turkey corona virus, the probable cause of a serious disease in turkey, poult enteritis mortality syndrome. This test will now provide the turkey industry with a rapid, sensitive, and specific diagnostic tool for this disease.

In Iowa, a protease-digested bacterin has been developed which is effective against mucosal disease swine dysentery. The cellular immunity that is produced is attributed to a specific group of T lymphocyte cells, CD8. This vaccine has now been patented and is expected to have significant impact on this disease in the pork industry.

In Iowa, early studies have shown that there are cells in the lung that are involved in the development of bovine pneumonia due to Pasteurella bacteria. These cells produce a substance that regulates movement of neutrophils and, therefore, affect the severity of the pneumonia that occurs. Because these changes are accompanied by marked increases in cytokines, appropriate therapies can now be developed that will improve the clinical outcome of such pneumonia cases in cattle.

Enterotoxigenic E. Coli cause severe diarrhea in both animals and humans. One of the factors involved in producing this disease is that intestinal cells of newborn animals and humans have a high affinity receptor for this specific organism. This information can now provide a basis for looking at methods to block these receptor sites and prevent the bacteria from producing their damage in the intestine. This research was conducted in Indiana.

CRITICAL AGRICULTURAL MATERIALS

Mr. Skeen. For fiscal years 1999 and 2000, please describe how the funds for commercializing alternative crops at the Polymer Institute are being used.

Response. The University of Southern Mississippi has one of the top two polymer science programs, and the focus of research and development conducted under this grant is on the oils of lesquerella, soybean, vernonia, and tung for use in paints, coatings, solvents, and fibers from kenaf for used in reinforced coatings. The use of these vegetable oils in paint and coating

formulations not only improves product performance, but also directly addresses a significant environmental issue which is volatile organic compounds.

Mr. Skeen. For the record, please provide a brief history of this research, including how much has been appropriated through fiscal year 2000.

Response. This research has continued to focus on utilizing agricultural raw materials as feedstocks for new industrial products or product substitutes for the polymer industry that have traditionally been derived from petroleum-based raw materials. The polymer industry is the largest chemical products industry in the world, and thus, there is much demand for polymer- related products such as foams, adhesives, coatings, elastomers, and high performance thin films.
The Polymer Institute continues with focused research and marketing technology and collaborates with industry on a variety of product development efforts, such as cosmetics, water-borne proofer for use on wood and other porous substrates and novel ultraviolet cured coatings with no emission of volatile organic compounds. Since 1992, this research has received $4,550,000 in Federal funds.

Mr. Skeen. What was accomplished in fiscal year 1999?

Response. Because architectural paints are always in high demand, the volatile organic compound emissions remain an environmental problem. The Polymer Institute has developed a paint additive formulated from castor oil that results in a high performance waterborne paint with no organic emissions and no odor. The Polymer Institute has one patent, issued in December 1999, and an additional five applications have been filed which will protect this technology. A new company, Southern Diversified Products, was formed to manufacture and distribute the novel product. The company is located in Jackson, Mississippi, and several pilot runs have been manufactured. The Polymer Institute has worked very closely with a major resin manufacturing company to develop commercial products, which are currently being field tested.

Aquaculture Centers

Mr. Skeen. In table format, please describe for the Committee how the fiscal year 1999 funds were used at each of these centers and their anticipated use in fiscal year 2000.

(The information follows.)

Projects funded in fiscal year 1999 by Regional Aquaculture Centers.

Western Regional Aquaculture Center

The Ecological Role and Potential Impacts of Molluscan Shellfish Culture in the Estuarine Environment

Disease Interactions Between Wild and Culture Salmonids

Development of Economical, High-Performance, Low-Polluting Feeds and Feeding Strategies

Control of Infectious Hematopoietic Necrosis Virus in Commercially-Reared Salmonid Fishes

Improving Pacific Oyster Broodstocks

Northeastern Regional Aquaculture Center

Aquaculture Waste Water and Waste Water Management
Finfish Nutrition and Diets
Finfish and Shellfish Health
Genetics and Breeding of Aquatic Species
Aquaculture Product Marketing
Aquaculture Production Methods

North Central Regional Aquaculture Center

Program Development Project
Publications and Extension Program
Culture Technology of Sunfish
Aquaculture Extension Education Outreach and Workshops

Southern Regional Aquaculture Center

Management of Aquacultural Effluents from Ponds
Management of Environmentally-Derived Off-flavors in Warmwater Fish Ponds
Control of Blue-green Algae in Aquaculture Ponds
Extension Publications, Videos, and Computer Software
Development of Improved Harvesting, Grading and Transport Technology for Finfish Aquaculture

Center for Tropical and Subtropical Aquaculture

Aquaculture Information Systems
National Coordinator for New Animal Drug Applications
Marine Foodfish Seedstock Program
Disease Management in Hawaiian Aquaculture
Aquaculture Extension and Training for the U.S.-Affiliated Pacific Islands
Aquaculture of Marine Ornamental Species
Demonstration and Training in the Management of Tilapia Seedstock and Production

In fiscal year 2000, funds will be allocated for continuation of high-priority projects initiated in previous years as well as new projects that are developed to address the emerging needs of the industry.

Mr. Skeen. Please provide a table for the record showing the amount of funding received by each center for fiscal years 1999, 2000, 2001.

(The information follows.)

Center	FY 1999	FY 2000	FY 2001
Western	$748,800	$748,800	$748,800
Northeastern	748,800	748,800	748,800
North Central	748,800	748,800	748,800
Southern	748,800	748,800	748,800
Tropical and Subtropical	748,800	748,800	748,800

Funding levels presented for FY 2001 represent the Administration's budget request.

Mr. Skeen. Provide a few specific examples of the projects funded with these grants.

Response. In a continuing program at the Western Regional Aquaculture Center, scientists from California, Idaho, and Montana are improving white sturgeon broodstock by enhancing growth and reproductive traits, spawning performance, cryopreserving sperm from genetically-superior broodstock, and producing a white sturgeon hatchery manual. Additionally, in a project entitled "Improving Pacific Oyster Broodstock", scientists from California, Oregon, and New Jersey are using state-of-the-art genetic techniques to improve the growth and disease resistance of the Pacific oyster. Studies are also being conducted by scientists from Washington, Idaho, and California to produce feeds and improve feeding strategies for salmon and trout that will increase growth rates while reducing the amount of nutrients released in effluents.

Scientists from New Hampshire, Connecticut, New Jersey, Rhode Island, and New York, funded through the Northeastern Regional Aquaculture Center, have conducted research into the development of the summer flounder aquaculture industry. This research has led to improved hatchery and grow-out techniques for the production of summer flounder seed and foodfish. Other culture information resulting from this research include optimum stocking density, improved spawning techniques, and enhanced feeding strategies for flounder larvae. Discoveries from this research will result in extension technology transfer fact sheets and educational workshops to disseminate this information to the industry.

At the North Central Regional Aquaculture center, scientists from Illinois, Iowa, Minnesota, North Dakota, and Missouri are investigating new culture technologies for the production of sunfish including nutrition studies, grading strategies, and commercial field trials. Extension personnel from Wisconsin, Michigan, Minnesota, Kansas, Iowa, Missouri, North Dakota, and Nebraska, funded through the North Central Regional Aquaculture Center, are going to provide in-service aquaculture training for Cooperative Extension and Sea-Grant personnel, and develop and provide aquaculture-related educational programs in the North Central region.

As a result of funding through the Southern Regional Aquaculture Center, research and extension scientists in Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee are cooperating to evaluate methods of managing commercial aquaculture ponds to discourage or

eliminate noxious communities of blue-green algae. This is a major problem in the commercial channel catfish industry. The presence of these algae in aquaculture ponds increase the incidence of off-flavor, and although the presence of off-flavor does not make the fish inedible from a food safety standpoint, off-flavor fish are unacceptable to consumers and fish processors will not buy these fish. Research into novel synthetic and natural compounds, algae-feeding fish, and pond nutrient manipulation are currently being conducted through the center to address this.

Scientists located in Hawaii, Guam, and the U.S.-Affiliated Pacific Islands, funded through the Center for Tropical and Subtropical Aquaculture, will develop and transfer innovative culture technologies for high-value marine ornamental fish and invertebrate species. Diversification into high-value species is considered essential to long-term economic sustainability of the commercial marine ornamental industry in the Pacific region. These studies should have an immediate impact for the commercial marine ornamental industry.

CANOLA

Mr. Skeen. Would you please describe for the Committee the work being carried out on canola under the alternative crops program for fiscal years 1999 and 2000?

Response. The rapid increase in consumer demand for canola oil since the mid-1980's has resulted in growing imports from Canada and Europe. Research and education conducted under this grant are helping domestic producers supply a greater share of this growing demand. Domestically grown canola has become a viable commercial crop, and acreage is expected to exceed 1.5 million this year. Except for the northern tier states that border Canada, canola remains a new or experimental crop and funding has been used to adapt varieties to the regions that are the most promising, including the Pacific Northwest, Great Plains, Midwest and the Southeast. Canola is being introduced into cropping systems in rotation with existing crops, reduced or no-till practices are being used, and pest management is being improved. Growers are being educated on optimized production practices and the potential economic benefits, so they are comfortable adopting canola in their traditional rotations.

Mr. Skeen. Please list the locations where this work is carried out, including the funding by location.

Response. Funding for canola research is provided to universities representing six regions established by the U.S. Canola Association. The funding amounts for each institution in FY 1999 are based on allotments determined by the U.S. Canola Association and are as follows:

CANOLA RESEARCH FUNDING

University of Arkansas	$ 78,813
University of Georgia	78,156
Southern Illinois University	77,967
Kansas State University	78,156
Montana State University	82,836
North Dakota State University	118,872
Total	514,800

HESPERALOE

Mr. Skeen. Would you please describe for the Committee the work being carried out on hesperaloe under the alternative crops program in fiscal year 1999 and 2000?

Response. Plant production and stand establishment of hesperaloe are being evaluated in long-term field plots at the Maricopa Agricultural Center. Irrigation systems, irrigation schedules, herbicide tests, and seed cleaning systems are all being evaluated to optimize production acreage. Hesperaloe, in addition to producing a superior fiber for specialty papers, shows promise as a source of natural products, especially for anti-tuberculosis activity. State of the art separation science guided by the bioassays will be used to extract, fractionate, isolate, and purify the active compounds.

Mr. Skeen. Please list the locations where this work is carried out and how much is provided.

Response. In fiscal year 1999, $187,200 were awarded to the University of Arizona. Another $187,200 will be awarded to the University of Arizona in fiscal year 2000.

RURAL DEVELOPMENT CENTERS

Mr. Skeen. How much in state, local, and private funding have the rural development centers been able to generate?

Response. The centers have generated $1,430,069 from state, local, and private partners as collaborative sponsors for their FY 2000 research and related extension education programs.

Mr. Skeen. For the record, please list each center and how much Federal support has gone to each in the last two fiscal years.

Response. Federal Support for each center in the last two fiscal years is indicated below.

Fiscal Year	Northeast	Southern	North Central	Western
1999	$278,418	$253,486	$487,918	$288,020
2000	255,880	255,880	603,660	255,880

SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION

Mr. Skeen. How were the funds for the Sustainable Agriculture Research and Education (SARE) Program used, by location, for fiscal years 1998, 1999, and 2000? Include with that information a table showing how much funding went to each SARE location.

Response. Funds for the Sustainable Agriculture Research and Education program were used in four regions and in the national office. Equal allocations were made to the four regions, which used the funds primarily to fund Research and Education grants and Producer Grants, and also for regional Administrative Councils. The remaining funds were used in the national office for communications and coordination and for information dissemination through the National Agricultural Library's Alternative Farming Systems Information Center, the Sustainable Agriculture Network, and conferences and other educational efforts.

Detailed fiscal year allocations are as follows:

	FY 1998	FY 1999	FY 2000
North Central Region	$1,744,840	$1,739,826	$1,736,421
Northeast Region	1,744,840	1,739,826	1,736,421
Southern Region	1,744,840	1,739,826	1,736,421
Western Region	1,744,840	1,739,826	1,736,421
Subtotal, Regional allocations	6,979,360	6,959,304	6,945,684
National Initiatives/projects:			
Natl Communications/coordination	219,000	240,500	247,715
National Agricultural Library	122,010	128,111	134,516
SARE Sustainable Ag Network	93,130	115,595	115,595
Natl Initiatives (education and conferences	152,500	44,490	44,490
Subtotal, Regional plus National	7,566,000	7,488,000	7,488,000
Federal Administration	240,000	320,000	320,000
SBIR	194,000	192,000	192,000
Total, SARE	$8,000,000	$8,000,000	$8,000,000

Mr. Skeen. Please list the four regional councils, their membership, and their annual budgets.

Response. The annual budget for each region was $1,739,826 in fiscal year 1999, and is $1,736,421 in fiscal year 2000. The four regional councils and their 1999 membership rosters are as follows:

North Central Region:

Dave Macarus, U.S. Environmental Protection Agency
Chicago, Illinois

Helene Murray, University of Minnesota
St. Paul, Minnesota

David Baltensperger, University of Nebraska-Lincoln
Scottsbluff, Nebraska

Ben Bartlett, Michigan State University-Extension
Chatham, Michigan

Peter Bierman, Ohio State University
Piketon, Ohio

Patrick Carr, North Dakota State University
Dickinson, North Dakota

Deborah Cavanaugh Grant, University of Illinois
Greenview, Illinois

James Goodman, farmer
Wonewoc, Wisconsin

Ron Macher, farmer/publisher
Clark, Missouri

Alan Schlegel, Kansas State University
Tribune, Kansas

Dan Specht, farmer
McGregor, Iowa

Bill Wilcke, University of Minnesota
St. Paul, Minnesota

Doug Zalesky, South Dakota State University
Rapid City, South Dakota

Daryl Buchholz, Kansas State University
Manhattan, Kansas

Jerry DeWitt, Iowa State University
Ames, Iowa

Adrianna Hewings, USDA-ARS
Peoria, Illinois

John Hirzel, farmer
Luckey, Ohio

Renee Hunt, Illinois Stewardship Alliance
Rochester, Illinois

Christine Lietzau, Michigan Department of Agriculture
Lansing, Michigan

Fred Madison, Wisconsin Geological/Natural History Survey
Madison, Wisconsin

Dave Swaim, Swaim & Associates Agronomic Consulting
Crawfordsville, Indiana

Jeffrey Vonk, USDA-NRCS
Lincoln, Nebraska

Jill Auburn, USDA-CSREES
Washington, District of Columbia

Harry Wells, U.S. Environmental Protection Agency
Washington, District of Columbia

Northeast Region:

J. Scott Angle, University of Maryland
College Park, Maryland

Melvin Westbrook, USDA-NRCS
Beltsville, Maryland

Dr. Herbert Cole, Pennsylvania State University
University Park, Pennsylvania

Hank Bissell, farmer
Starksboro, Vermont

Thomas Handwerker, Univ of Maryland-Eastern Shore
Princess Anne, Maryland

Janet Britt, farmer
Schaghticoke, New York

Tim Griffin, University of Maine Cooperative Extension
Orono, Maine

Michael Brubaker, Brubaker Agronomic Consulting
Ephrata, Pennsylvania

Thomas Sexton, USDA-ARS
Beltsville, Maryland

Porter Little, CoBank
Springfield, Massachusetts

Michael Heller, Clagett Farm
Marlboro, Maryland

Cass Peterson, farmer
Warfordsburg, Pennsylvania

Lynda Brushett, Niche Marketing
Barrington, New Hampshire

Cam Tabb, farmer
Kearneyville, West Virginia

Timothy Bowser
Pennsylvania Association for Sustainable Agriculture
Millheim, Pennsylvania

Dave Smith, Cornell University
Ithaca, New York

Terry Bourgoin, Maine Department of Agriculture
Augusta, Maine

Dave Eckhardt, U.S.Geological Survey
Ithaca, New York

Jill Auburn, USDA-CSREES
Washington, District of Columbia

Harry Wells, U.S. Environmental Protection Agency
Washington, District of Columbia

Southern Region:

Adell Brown, Mississippi Valley State University
Ita Bena, Mississippi

Peggy Barlett, Emory University
Atlanta, Georgia

Roger Barlow, Mississippi Department of Agriculture & Commerce
Jackson, Mississippi

Sam Bass, Clemson University Extension
Chesterfield, South Carolina

Oscar P. Butler, South Carolina State University
Orangeburg, South Carolina

Steve Carmichael, USDA-NRCS
Lawrenceville, Georgia

Claud D. Evans, farmer
Okemah, Oklahoma

Phil Greeson, U.S. Geological Survey
Norcross, Georgia

Shirley Harris, farmer
Millington, Tennessee

Greg Henson, University of Kentucky Extension Service
Calhoun, Kentucky

Janie Hipp, National Center for Agricultural Law Research and Information
Fayetteville, Arkansas

Alex Hitt, farmer
Graham, North Carolina

Rose Koenig, University of Tennessee
Knoxville, Tennessee

Jackie Judice, Northside Planting
Franklin, Louisiana

Thomas H. Klindt, University of Tennessee
Knoxville, Tennessee

Steven Muntz, Heifer Project International
Mt. Sterling, Kentucky

Mariette Hiu Newcomb, Potomac Vegetable Farms
Vienna, Virginia

Jerry Pennick, Federation of Southern Cooperatives
Eastpoint, Georgia

La Rhea Pepper, farmer
O'Donnell, Texas

Tony Smith, farmer
Arlington, Georgia

Richard Soper; USDA-ARS
Athens, Georgia

Christine T. Waddill, University of Florida
Gainesville, Florida

Jill Auburn, USDA-CSREES
Washington, District of Columbia

Harry Wells, U.S. Environmental Protection Agency
Washington, District of Columbia

Western Region:

Larry Thompson, Thompson Farms
Boring, Oregon

Robert Heil, Colorado State University
Fort Collins, Colorado

Mike Somerville, USDA-NRCS
Phoenix, Arizona

Billy Dictson, New Mexico State University Cooperative Extension
Las Cruces, New Mexico

Antoinette Betschart, USDA-ARS
Albany, California

Kai Siedenburg, California Sustainable Agriculture Working Group
Santa Cruz, California

Kathleen A. McCarthy, U.S. Geological Survey
Portland, Oregon

Dennis Y. Teranishi, Hawaiian Host Incorporated
Honolulu, Hawaii

Mark W. Frasier, rancher
Woodrow, Colorado

Susan Matsushima, Alluvion Incorporated
Haleiwa, Hawaii

Ralph Peck, Montana State Department of Agriculture
Helena, Montana

Jill Auburn, USDA-CSREES
Washington, District of Columbia

Harry Wells, U.S. Environmental Protection Agency
Washington, District of Columbia

Mr. Skeen. Please list the administrative or overhead costs of each regional council.

Response. The staffing costs for the SARE regional programs for fiscal year 1999 are as follows. Approximately one-third to one-half of these staff costs are spent on program communications and outreach, in addition to program administration.

	Salaries	Benefits	Total
North Central Region	$151,045	$32,527	$183,572
Northeast Region	123,326	39,094	162,420
Southern Region	168,017	46,528	214,545
Western Region	131,665	51,349	183,014

Total Full-Time-Equivalent staff paid by SARE funds in fiscal year 1999 for each region is as follows:

North Central Region	5.50
Northeast Region	3.80
Southern Region	4.48
Western Region	3.50

USDA SUSTAINABLE AGRICULTURE PROGRAM

Mr. Skeen. Please provide for the record the USDA funds related to sustainable agriculture, by agency, for fiscal years 1999, 2000, 2001.

(The information follows.)

UNITED STATES DEPARTMENT OF AGRICULTURE
Sustainable Agriculture Research
($000)

Agency	FY 1999	FY 2000	FY 2001
Agricultural Research Service:			
Soil, Water, and Air Sciences	$63,958	$74,551	$70,575
Plant Sciences	116,504	128,102	125,832
Animal Sciences	64,089	65,583	62,086
Commodity Conversion and Delivery	25,127	31,985	30,280
Human Nutrition	2,277	3,722	3,524
Alternative Farming System (NAL)	230	289	289
Total, ARS	272,185	304,232	292,586
CSREES - Research and Education:			
Hatch Act	63,714	63,714	63,714
Cooperative Forestry Research	326	326	326
1890 Colleges and Tuskegee Univ.	8,632	8,891	8,891
Animal Health, Sec. 1433	862	862	862
Special Research Grants	6,463	6,101	2,050
National Research Initiative	8,109	8,109	9,771
Sustainable Agriculture	8,000	8,000	10,500
Total, CSREES Res. & Educ.	96,106	96,003	96,114
CSREES - Extension Activities:			
Smith-Lever 3b & c	15,450	15,450	15,450
Smith-Lever 3d (Pest Mgmt.)	10,783	10,783	12,269
Sustainable Agriculture	3,309	3,309	4,500
Total, CSREES Ext. Activities	29,542	29,542	32,219
CSREES - Integrated Activities:			
Crops at Risk from FQPA Implem.	0	1,000	3,000
FQPA Risk Mitigation	0	4,000	10,000
Total, CSREES Integrated Activitie	0	5,000	13,000
TOTAL, USDA	397,833	434,777	433,919

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

Mr. Skeen. For the record, please provide a table that shows the amount of funding for each of the past three years for the Small Business Innovation Research Program. Please breakout the source of funding.

(The information follows.)

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

Agency	FY 1998	FY 1999	FY 2000 Estimate
Agricultural Research Service	$830,000	$1,450,000	$1,580,000
Cooperative State Research, Education and Extension Service	8,397,612 a/	12,560,393 b/	14,084,409 c/
Economic Research Service	461,705	305,275	287,725
Forest Service	431,166	439,686	578,571
National Agricultural Statistics Service	5,125	6,250	7,875
FAS/International Cooperative Development	12,500	12,500	11,275
Total	10,138,108	14,774,106	16,550,855

a/ Excludes $2,456,248 of SBIR funds which were carried forward for award in FY 1999.
b/ Excludes $990,688 of SBIR funds which were carried forward for award in FY 2000.
c/ Includes SBIR amount of $1,680,000 for the Fund for Rural America and the Initiative for Future Agriculture and Food Systems.

NATIVE AMERICAN INSTITUTIONS ENDOWMENT FUND

Mr. Skeen. The Native American Institutions Endowment Fund for fiscal year 2001 shows $7.1 million. What is the reason for the $2.5 million increase?

Response. Many campuses at the 1994 land-grant institutions, or Tribal Colleges, consist largely of condemned buildings which pose a significant health and safety risk to both students and faculty. Students lack access to basic laboratories and equipment, making accreditation difficult. Faculty turnover at these institutions is very high, due in part to the poor quality of the facilities. This places an additional faculty recruitment burden on the administration of the Tribal Colleges. At the same time, education enrollment at Tribal Colleges is increasing dramatically, placing further burdens on an already fragile infrastructure. The $2.5 million increase for the Native American Institutions Endowment Fund will increase the interest derived on the Endowment Fund which is disbursed on a formula basis to the Tribal Colleges. CSREES will strongly encourage the Tribal Colleges to use the interest payments to support facility renovation and construction. These funds will address the critical need for infrastructure funding for the Tribal Colleges to enhance their ability to conduct research, extension, and higher education activities important to the communities they serve. Please note that the increase of $2.5 million is offset by discretionary receipts so that the only budgetary increase is the change in the interest to the endowment.

NATIVE AMERICAN INSTITUTIONS ENDOWMENT FUND

Mr. Skeen. How much interest has the fund accumulated since initial funding was provided? What interest rate are these funds earning in fiscal year 2000 and how have funds been distributed to universities by fiscal year to date?

Response. The endowment has earned $2,221,735 in interest which has been distributed to the 1994 Institutions. The long term investment strategy has been to stagger the investments so that one Treasury Note matures each year. In fiscal year 2000, funds are invested in Treasury notes with interest rates of 5.75 percent, 6.25 percent, 6.50 percent, and 7.25 percent.

The following table shows the distribution of interest to the 1994 Institutions.

Cooperative State Research, Education, and Extension Service
Native American Institutions Endowment Fund Interest
Funding History

Institutions	FY 1997	FY 1998	FY 1999	FY 2000
Bay Mills Community College, MI	$2,658	$10,622	$14,330	$22,666
Blackfeet Community College, MT	4,143	14,968	22,169	42,290
Candeska Cikana (Little Hoop) Community College, ND	2,293	7,932	13,828	19,245
College of Menominee Nation, WI	2,593	9,204	14,822	21,578
Crownpoint Institute of Technology, NM	2,974	14,217	22,372	23,067
Dine' College, AZ (Navajo Community College)	13,123	40,191	58,332	90,246
D-Q University, CA	2,502	8,916	11,291	14,959
Dull Knife Memorial College, MT	2,429	9,652	14,173	20,259
Fond du Lac Tribal and Community College, MN	1,867	8,348	10,991	16,862
Fort Belknap College, MT	2,669	9,870	14,265	20,140
Fort Berthold Community College, ND	2,587	10,963	15,584	26,226
Fort Peck Community College, MT	3,611	14,163	20,048	27,981
Haskell Indian Nations University, KS	6,849	28,607	37,791	62,170
Institute of American Indian Arts, NM	2,574	8,282	12,561	17,772
Lac Courte Orielles Ojibwa Community College, WI	3,529	12,398	18,825	28,824
Leech Lake Tribal College, MN	2,430	10,470	15,528	24,253
Little Big Horn College, MT	3,239	10,990	15,401	22,988
Little Priest Tribal College, NE	--	--	10,387 A/	15,137
Nebraska Indian Community College, NE	2,738	11,019	14,354	19,685
Northwest Indian College, WA	5,138	19,301	29,148	45,325
Oglala Lakota College, SD	5,886	26,218	39,601	58,615
Salish Kootenai College, MT	6,296	24,533	40,313	55,515
Si Tanka College (Cheyenne River Community College) SD	2,494	10,699	13,115	20,931
Sinte Gleska University, SD	4,990	19,958	27,046	48,078
Sisseton Wahpeton Community College, SD	2,409	8,426	12,596	18,768
Sitting Bull College, ND	2,918	12,157	17,840	26,201
Southwest Indian Polytechnic Institute, NM	5,436	26,094	35,382	39,289
Stone Child College, MT	3,140	12,317	17,152	25,801
Turtle Mountain Community College, ND	4,669	19,725	28,017	40,851
United Tribes Technical College, ND	3,135	13,100	29,889	26,053
Subtotal, Interest Payments to the Universities	111,117	433,341	646,731	941,676
Federal Administration	4,630	18,056	26,947	39,237
Total, Endowment Interest	115,747	451,397	673,678	980,913

A/ Section 251 of the Agricultural Research, Extension, and Education Reform Act of 1998 amended Section 532 of the Educational Land-Grant Status Act of 1994 to add Little Priest Tribal College.

USDA-HISPANIC EDUCATION PARTNERSHIP GRANTS PROGRAM

HIGHER EDUCATION

Mr. Skeen. For the record, provide a list showing which universities and how much each received from this account and the amount the institutions cost-shared.

Response. Cost sharing, while encouraged, is not required for this program. USDA does not keep a record of the amounts institutions voluntarily cost-shared. Fiscal year 2000 proposals are still in the peer review stage and awards have not been made. The colleges and universities receiving awards and the amounts they have received for fiscal years 1997, 1998, and 1999 are:

FY 1997 Higher Education Hispanic-Serving Institutions
Education Grants Program
Total Funds Awarded to States and Institutions

State	Institution	Awards
Arizona	Central Arizona College	$98,100
California	California State University, Los Angeles	89,935
California	California State University, Bakersfield	89,937
California	Porterville College	29,215
California	Rancho Santiago College	179,980
Colorado	Trinidad State Junior College	89,995
Florida	Miami-Dade Community College	89,996
New Mexico	Albuquerque Technical Vocational Institute	178,683
New Mexico	University of New Mexico	90,000
New York	Eugenio Maria De Hostos Community College	150,000
Puerto Rico	Interamerican University of Puerto Rico	89,919
Texas	Southwest Texas Junior College	88,895
Texas	Texas A&M University - Kingsville	180,000
		$1,444,655

FY 1998 Higher Education Hispanic-Serving Institutions
Education Grants Program
Total Funds Awarded to States and Institutions

State	Institution	Awards
California	Hartnell Community College	$135,185
New Mexico	New Mexico State University	270,000
New Mexico	Northern New Mexico Community College	270,000
New Mexico	Santa Fe Community College	292,548
New York	Bronx Community College	219,906

Puerto Rico	Inter American University of Puerto Rico	140,255
Puerto Rico	Inter American University of Puerto Rico	270,000
Texas	Palo Alto College	265,222
Texas	Texas A&M University - Kingsville	270,000
Texas	University of Houston - Downtown	284,982
		$2,418,098

FY 1999 Higher Education Hispanic-Serving Institutions
Education Grants Program
Total Funds Awarded to States and Institutions

State	Institution	Awards
California	California State University - Fresno	$299,934
California	Porterville College	99,549
California	California State University - Northridge	299,182
California	Mt. San Antonio College	297,045
Colorado	Trinidad State Junior College - Valley Campus	148,229
Florida	Miami-Dade Community College	150,000
New Mexico	University of New Mexico	299,989
New York	Bronx Community College	300,000
New York	Lehman College	238,007
Puerto Rico	Colegio Universitario del Este	298,690
Puerto Rico	University of Puerto Rico - Mayaguez	150,000
Texas	Sul Ross State University	150,000
		$2,730,625

Mr. Skeen. The fiscal year 2001 budget proposes a funding increase of $650,000 for a total program level of $3.5 million. Please describe how these additional funds would be used. How many additional scholars or universities would receive funding?

Response. This is the only USDA competitive grants program specifically targeted to Hispanic-Serving Institutions, most of which have not been previously involved with USDA programs. The competitive, peer reviewed program assures scientific relevance and education quality. Current appropriations support proposals from only 5 percent of approximately 200 eligible Hispanic-Serving Institutions. The requested increase will expand the number of high-quality grant proposals funded, and effectively increase the number of Hispanic-Serving Institutions participating in USDA academic initiatives by 25 percent.

The program builds instructional capacity, establishes links with business, conducts outreach to Latino communities, develops curricula, enhances faculty, and meets regional education needs. Over the past years, the average grant size has been $190,000. The proposed $650,000 increase for

fiscal year 2001 supports grants to more Hispanic-Serving Institutions to attract, retain, and graduate outstanding students capable of enhancing the Nation's food and agricultural scientific, technical, and professional work force. The increase will enable minority-serving institutions to assist USDA in carrying out its mission through increased Hispanic-Serving Institutions offering courses and degrees in food and agricultural sciences; new or expanded curricula in food, fiber, natural resources, and related topics; more Hispanic students pursuing degrees and taking courses in food and agricultural sciences; university and business partnerships to train students in agribusiness and agriscience careers; outreach to encourage Hispanic students to attend college and consider careers in the food and agricultural sciences; and university/business consortia to obtain and expand educational resources for agriculture.

CAPACITY BUILDING PROGRAM

Mr. Skeen. How many students were supported by the Capacity Building Program in fiscal year 1999?

Response. In fiscal year 1999, approximately 200 students were supported by this program through scholarships or employment.

Mr. Skeen. Provide a breakout for fiscal year 1999 of how much was spent in direct support of students and how much was spent on scientific instrumentation purchases.

Response. In fiscal year 1999, direct support of students by the Capacity Building Program was $1,240,674. Scientific instrumentation purchases were $1,072,009.

Mr. Skeen. Are you able to quantify how many students have gone from this program into the field of food and agriculture science and business?

Response. Student recruitment and retention are two of the activities supported under the 1890 Institution Capacity Building Grants Program. Approximately 200 students were directly supported in fiscal year 1999. It has been our understanding that requiring institutions to track and report student placement would require new forms/survey instruments and the related data collection/burden clearance by OMB--under the Paperwork Reduction Act. However, the Food and Agricultural Education Information System--FAEIS--contains degrees awarded data for the 1997/1998 academic year reported by 50 percent of the 1890 Institutions and placement data for graduates reported by 41 percent of these schools. Eight 1890 Institutions awarded 352 undergraduate and graduate degrees in agriculture, natural resources, and forestry. Reporting 1890 Institutions placed 96 baccalaureate graduates in food and agricultural science and business positions; 26 went on to graduate school. The schools placed 17 master's graduates in government, education, and private sector positions related to the food and fiber system; 9 went on to continue their graduate study. We are urging more 1890 universities to report degrees awarded and placement data.

HIGHER EDUCATION

Mr. Skeen. How many doctoral students and masters fellows are being supported by this funding for fiscal years 1998, 1999 and 2000?

Response. Since 1987 this program has supported only doctoral students. The appropriations for fiscal years 1997 and 1998 were combined to support 113 doctoral fellowships. The appropriations for fiscal years 1999 and 2000 were combined to support 91 doctoral fellowships.

Mr. Skeen. How many applications for the challenge grant have you received in fiscal year 2000?

Response. We received a total of 103 proposals for the fiscal year 2000 Higher Education Challenge Grants Program.

Mr. Skeen. The budget proposes a $2 million increase in the program, for a total program level of $5 million. How many fellows can be supported by the proposed funding increase, and the total program level?

Response. Of the proposed $2 million increase in funding, $1.2 million would be used to fund 40 Masters Fellows at $14,000 per year for 2 years. An additional $1,000 per Fellow per year would be awarded to cover university administration costs. The remaining $800,000 would fund 12 additional Doctoral Fellows for 3 years at $21,000 per year. An additional $1,000 per Fellow per year would be awarded to cover university administration costs. This will fund the first group of Masters Fellows since 1986 and bring the number of Doctoral Fellows supported to 1,076.

Since relatively few programs have Doctoral programs in the food and agricultural sciences, actively supporting Masters Fellows will significantly increase the number of institutions that are able to participate in the program. By reaching a broader array of institutions, the program will dramatically expand its abilities to attract women and minorities into graduate careers in the food and agricultural sciences.

Mr. Skeen. How does this compare with historic demands for program participation?

Response. The number of applications fluctuates. Applications received in fiscal year 2000 for the Higher Education Challenge Grants Program were down from previous years. We believe this was due to the short turn around time between release of the Request for Proposals and the application due date. The number of proposals received each year for this program since its inception are:

Fiscal Year	Number of Proposals
1990	228
1991	141
1992	131
1993	110
1994	106
1995	130
1996	125
1997	117
1998	164
1999	123
2000	103

PESTICIDE IMPACT ASSESSMENT

Mr. Skeen. Please quantify, for the record, the fiscal year 1999 program accomplishments and your plans for fiscal years 2000 and 2001.

Response. The Pesticide Impact Assessment Program--PIA--, in conjunction with USDA's Office of Pest Management Policy--OPMP--, demonstrated its commitment to gathering information needed for implementation of the Food Quality Protection Act--FQPA. CSREES provided additional funding to each of the four regions in fiscal year 1999 to facilitate the development of additional crop profiles. In fiscal year 1999, over 150 crop profiles were developed and mounted on the World Wide Web under the PIA Homepage making them accessible to all. These profiles constitute a growing body of knowledge on U. S. crop production and pest management, essential for agriculture's seamless transition into biologically-based pest management. Profiles have long term value and are invaluable in the development of Pest Management Strategic Plans necessary for risk mitigation. Pest Management Strategic Plans are a window into the direction that the American public, and FQPA appears to be urging the U. S. agriculture to proceed. Crop profiles have enhanced USDA's interaction with the Environmental Protection Agency since they have become the foundation document and key resource use by the regulatory Agency in consideration of risk options. Another accomplishment for PIA was connecting state land-grant scientists with OPMP. This connection to provide a nationwide feed-back network to the Federal partner for applied agricultural science related to FQPA issues. In fiscal year 2000, PIA was moved to the Integrated Activities Program, Section 406 of the Agriculture Research, Education and Economics Reform Act. All funds will be distributed competitively to colleges and universities through grants written to a request for proposals. The request for multi-state, multi-disciplinary proposals will be developed to reflect federal and regional pest management needs and priorities.

FEDERAL ADMINISTRATION

Object Class Table

Mr. Skeen. Please provide for the record an object classification table for Federal Administration, including all funds available for that purpose for fiscal years 1999, 2000, and 2001?

(The information follows:)

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE--
CLASSIFICATION BY OBJECTS FOR FEDERAL ADMINISTRATION FUNDS
FISCAL YEAR 1999 AND ESTIMATED 2000 AND 2001
(Dollars in Thousands)

		FY 1999	FY 2000	FY 2001
Personnel Compensation:				
11	Total personnel compensation	$19,732	$22,494	$23,364
12	Personnel benefits	4,081	4,619	4,785
13	Benefits for former personnel	1	1	1
benefits	Total pers. Comp. &	23,814	27,114	28,150
Other Objects:				
21	Travel	1,661	1,747	1,587
22	Transportation of things	60	80	75
23.3	Comm./utilities/misc. charges	784	839	847
24	Printing and reproduction	968	1,018	1,016
25.1	Advisory and assist. services	0	0	0
25.2	Other services	3,085	3,531	2,791
25.3 services	Purchases of goods and	3,445	3,982	3,118
26	Supplies and materials	670	952	936
31	Equipment	61	232	209
41	Grants, Contracts, etc.	15,733	14,974	1,043
	Total other objects	26,467	27,355	11,622
obligations	Total direct	50,281	54,469	39,772
Staff years:		381	421	422

FEDERAL ADMINISTRATION
Object Class 25.2

Mr. Skeen. Provide a sub-object class breakout of Object Class 25.2, Other Services, for fiscal years 1999, 2000, and 2001.

(The information follows:)

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

FEDERAL ADMINISTRATION--BREAKOUT OF OBJECT CLASS 25.2

(Dollars In Thousands)

Category	FY 1999	FY 2000	FY 2001
Management Council	109	145	90
Working Capital	529	600	400
Reimbursable Programs	22	23	23
Training	226	220	198
Intergovernmental Personnel Act	346	425	400
Services	1,303	1,600	1,280
Contracting Support	155	160	160
University Support	395	358	240
Total Object Class 25.2	3,085	3,531	2,791

PEER PANELS

Mr. Skeen. How much did CSREES pay out in honoraria and travel for peer panels in fiscal year 1999? What is the budget for fiscal year 2000 and 2001?

Response. In fiscal year 1999, honoraria costs were $209,234 and travel costs were $650,280. These costs are associated with the review of proposals submitted to the National Research Initiative, Higher Education Programs, competitively awarded grant and extension programs, and the Community Food Projects. In fiscal year 2000, estimated costs for honoraria and travel are $230,000 and $715,000 respectively and in fiscal year 2001, $276,000 and $858,000 respectively.

The Federal government provides honoraria to scientists and others for the service they provide as panelists. The panelists review and assess the quality of grant proposals submitted to the Federal government, thus enabling the government to fund the highest quality work. The honorarium is provided as compensation, as incentive, and as a token of appreciation to the reviewer for a service that could not be provided to the government by other means. The government relies on this system to: (1) have access to the large source of high quality expertise necessary to adequately judge the merits of a large and diverse number of submitted proposals, and (2) have a source of individuals who are considered peers to the applicants.

RESEARCH FEDERAL ADMINISTRATION PROJECTS

AGRICULTURAL DEVELOPMENT IN THE AMERICAN PACIFIC

Mr. Skeen. Please provide a description of the research that has been funded under the Agricultural Development in the American Pacific program.

Response. The Agricultural Development in the American Pacific (ADAP) is a primary means for land-grant research, extension, and instruction programs of the five participating institutions of American Samoa Community College, College of Micronesia, Northern Marianas College, University of Guam, and University of Hawaii, to collaborate and cooperate to enhance their impact on Pacific tropical agriculture and communities. ADAP is a mechanism to address common regional client-based issues while maintaining cultural, rural, economic, and environmental integrity. This research grant is awarded noncompetitively to a program planned and approved by the five involved land-grant institutions.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the five participating institutions are geographically dispersed yet facing many similar issues which can best be served through extensive networking and communication. ADAP facilitates communications and seeks to raise levels of academic achievement and improve the quality of education. ADAP's most unique feature is that twice each year it brings together the five Deans/Directors to discuss agriculture and human resources issues facing isolated, tropical ecosystems in the Pacific, and to plan and implement activities to address those issues. Priorities are categorized in three areas: sustainable systems, collaborations/partnerships, and communication systems. Activities range from joint and collaborative efforts to overcome taro leaf blight in the Pacific, to seeking recognition of Pacific tropical agriculture by the National Association of State Universities and Land-Grant Colleges.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. ADAP's goals are to develop human resources within the institutions, to manage more effectively agricultural programs within and among the institutions, and to focus available resources on critical agricultural issues of the Pacific. Ongoing projects include animal health surveys, livestock waste management, dietary guidelines for Pacific foods, youth-at-risk assessment, artificial insemination demonstration/education, and market information collaboration with "state" Departments of Agriculture. ADAP is now working jointly with the 22-nation Secretariat of the Pacific Community in developing a paraveterinary program. This program will use distance learning and site visits to train students from the cooperating nations and territories in animal health. This is a critical need for the Pacific region. Both ADAP and the Secretariat of the Pacific Community will contribute money as well as skilled personnel to assist in this project. In another regional cooperative effort, ADAP led a retreat for strategic planning among the "state" and national Departments of Agriculture in the Pacific region in July 1999. That retreat identified food insecurity as a major issue for Pacific island nations, and ADAP is formulating a forum in collaboration with the Secretariat of the Pacific Community to address the issue.

Mr. Skeen. How long has this work been underway and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. This work was funded for seven years with an annual appropriation of $650,000 to the former Extension Service. In fiscal year 1994, an appropriation of $608,000 was made to CSREES to continue the ADAP program. In fiscal year 1995 the appropriation was $527,000. The fiscal years 1996 and through 2000 appropriations were $564,000 each year. The appropriation total to CSREES is $3,955,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds are not provided. Unspecified in-kind support, such as facilities, equipment, and administrative support, are provided by each institution and, in some specific projects, by non-ADAP collaborating institutions.

Mr. Skeen. Where is this work being carried out?

Response. This work is being carried out by American Samoa Community College, College of Micronesia, Northern Marianas College, University of Guam, and the University of Hawaii.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The ADAP program has been achieving original program objectives, particularly in the areas of improvement in institutional capacity and communications. It is anticipated that an additional 5 to 10 years will be needed to fully achieve collaborative integration of the American Pacific land-grant programs.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A formal review of the ADAP program was conduted July 1-10, 1997, and included visits by review team members to American Samoa Community College, College of Micronesia, Northern Marianas College, University of Guam, and University of Hawaii. ADAP incorporated review recommendations in preparing and adopting a new five-year 1997 strategic plan. An agency specialist conducts a merit review of the proposals submitted in support of the appropriation annually. In a review of the April 1999 proposal, progress was judged satisfactory.

AGRICULTURAL WASTE UTILIZATION, WEST VIRGINIA

Mr. Skeen. Please provide a description of the research that has been funded under the Agricultural Waste Management, West Virginia grant.

Response. The West Virginia Department of Agriculture is conducting a project to validate the applicability and effectiveness of anaerobic filtration for treating municipal and agricultural wastes. POWER anaerobic filtration is a leading-edge technology specifically developed to biologically recover nutrients and energy from organic waste streams and produce an effluent which meets discharge permit requirements.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The current need for this technology is local, national, and

international. The beneficiaries of this technology will be both the people and the environment anywhere in the world where problems of food, fertilizer, and energy shortages are currently in conflict with the preservation of environmental quality. The direct benefits include enhanced and expanded waste water capacity, creation of new jobs, and revenue from by-products and water quality improvement.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to determine the applicability of anaerobic digestion to convert organic waste materials to energy in the form of biogas, thereby reducing the amount of organic matter for disposal. The goal will go beyond the testing of waste materials in the digester and proceed with a program to compare the microbiological loading of rivers, where known environmental pollution is measurable, and where the total bacterial concentration in the rivers could be determined in real-time with a bioprobe. Several demonstration tests have been conducted on municipal solid waste, municipal sludge, poultry mortality and poultry litter. These demonstrations have validated the applicability of this technology to a waste stream formulated to reduce measurable river and stream pollution.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 and the appropriation for fiscal year 1998 was $360,000; fiscal year 1999 was $250,000; and fiscal year 2000 was $425,000. A total of $1,035,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-Federal funds are not being expended.

Mr. Skeen. Where is this work being carried out?

Response. Research is conducted at Moorefield, West Virginia and West Virginia State College, Charleston, West Virginia.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date of the original objectives is June 30, 2000. These objectives are within the original schedule. The additional objectives should be completed by June 30, 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An on-site evaluation of the project was conducted in January 2000. The pilot scale digester has been operating continuously since 1995, treating a variety of municipal and agricultural wastes. In 1999 it has primarily been used to treat poultry litter and poultry mortalities. The components of the primary digester are: mix tank, holding tank, grit removal trap, feed tank, insulated digester with mixing capability, screen separator for the effluent, biogas treatment to remove impurities, engine unit that runs on biogas, and a computer that controls the mixing and feeding of the

digester. In June 1999 an anaerobic filtration unit was added to further treat the effluent of the primary digester. The anaerobic filtration unit operates at approximately 100 degrees Fahrenheit, while the primary digester operates at 130 degrees Fahrenheit. The anaerobic filtration unit is filled with pieces of plastic pipe to provide additional surface area for the bacteria to grow upon and thereby converting more of the organics into biogas. Data on treatment efficiencies for both digesters have been collected. The samples collected are analyzed at the laboratories of the West Virginia Department of Agriculture in Moorefield, WV. The typical analyses consists of: total solids, volatile solids, volatile fatty acids, total kjeldahl nitrogen, phosphorus, pH, and fecal coliform. The treated effluent is applied daily to nearby pasture land. The separated solids are collected and sent to West Virginia State College for use in field studies to determine plant growth response to the nutrients.

NATIONAL ALTERNATIVE FUELS LABORATORY

Mr. Skeen. Please provide a description of the research that has been funded under the National Alternative Fuels Laboratory (NAFL) grant.

Response. Through a nationally-marketed collaboration program in which the NAFL matches about half of its USDA funding with nonfederal money to work on industry-relevant research, NAFL staff have 1) developed a U.S. Federal Aviation Administration-certified lead-free ethanol- and biodiesel-containing alternative to leaded aviation gasoline that should be commercially available at Midwest airports by March 2000, 2) resolved ethanol-in-gasoline performance and environmental issues to accelerate the use of ethanol, 3) initiated new biomass fuel developments including a process to produce butanol --- a high octane gasoline additive that helps reduce automobile evaporative and tailpipe emissions --- from agricultural resources, 4) initiated and coordinated the 27-member Red River Valley Clean Cities Coalition to increase the number of alternative fuel vehicles in regional public and private fleets, and 5) built E85 refueling sites in North Dakota.

Mr. Skeen. According to the research proposal or the principal researcher, what is the national, regional, or local need for this research?

Response. As stated by former CIA director R. James Woolsey, our nation needs to develop commercially viable alternatives to fossil fuels to ensure energy security, improve air quality, and provide employment. It is crucial to national security and economic development that these new fuels are accurately represented in the marketplace and given an opportunity to compete fairly with traditional fossil fuels. The NAFL provides unbiased scientific data on fuel performance and environmental effects. Regional need for the research derives from the need to support regional agriculture and associated industries through 1) development of new biomass fuel industries based on new crops and conventional crop residues and 2) development of economic uses for agricultural co-products.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. The primary original goal was to develop a database of at-the-pump-sampled conventional, reformulated, and alternative transportation fuels sold in the upper Midwest and throughout the U.S. to enable comparison of current and historical fuels on the basis of chemical and physical properties. This fuels database is being expanded to include how gasoline chemistry affects air quality and fuel performance. Another original goal was to provide information on conversion of crop residues, agriculture processing wastes,

high-cellulose-content municipal wastes, and other biomass materials to alternative fuels. The NAFL program supported North Dakota's first two public E85 refueling sites, initiated an ongoing industry-supported effort to develop and build a new ag co-product-to-lactic acid plant in the Grand Forks region ---lactic acid is a building block for new bio-based polymers--- helped resolve ethanol blend evaporative emissions issues and E85 engine cold-start problems, and initiated an ongoing industry collaboration to demonstrate the viability of producing and utilizing biomass-based butanol, a clean-burning gasoline and diesel fuel additive.

Mr. Skeen. How long has this work been underway, and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The NAFL work began in fiscal year 1991 and was, in part, sponsored by this grant. USDA appropriations in fiscal year 1991 through fiscal year 1993 were $250,000 per year. Later awards were $235,000 in fiscal year 1994, $204,000 in fiscal year 1995, and $218,000 per year in fiscal years 1996 through 2000. A total of $2,279,000 has been appropriated over 10 years.

Mr. Skeen. What is the source and amount of nonfederal funds provided by fiscal year?

Response. To date in fiscal year 1999, $85,000 in nonfederal collaborative funding has been secured from the American Coalition for Ethanol, the South Dakota Corn Utilization Council, and the American Lung Association of Minnesota. A total of $1,160,000 in nonfederal funds has been secured for performance of NAFL program objectives over the duration of this grant. During fiscal year 1991 through fiscal year 1993, nonfederal funding from the State of Illinois totaled $630,000. For fiscal year 1994, nonfederal funding of $105,000 was secured from the American Corn Growers' Association, the Renewable Fuels Association, and others. For fiscal years 1995, 1996, 1997, and 1998, nonfederal funding totals of $50,000, $60,000, $140,000, and $90,000, respectively, were secured from corn grower organizations, state agriculture departments, alternative fuels technology companies, and regional economic development agencies.

Mr. Skeen. Where is this work being carried out?

Response. The work is performed at the University of North Dakota Energy & Environmental Research Center --- EERC --- in Grand Forks. The EERC is a research, development, demonstration, and commercialization facility that employs about 200 scientists, engineers, and support personnel.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The completion date for the original objectives was April 30, 1992. The objectives were met. The work was then expanded to include partnerships with industry and agriculture. The NAFL has been established as a center of expertise for development and demonstration of bio-based fuels, investigating fuel chemistry effects on engine performance and air quality, dissemination of accurate and objective information regarding ethanol in gasoline, and ethanol feedstock assessment and process development. Additional tasks include commercializing an ethanol-based aviation gasoline, implementing industry collaborations to produce lactic acid and butanol from regional agricultural resources, and administering the Red River Valley Clean Cities Coalition. These tasks should be completed by 2002.

Mr. Skeen. What was the last agency evaluation of this project? Provide a summary of the last evaluation.

Response. In June 1998, the USDA conducted an on-site evaluation, and the NAFL program was given a very favorable review. The program continues to be a model for federal-private sector collaborations. Personnel have continued to meet or exceed program objectives detailed at the initiation of each annual performance period.

ANIMAL WASTE MANAGEMENT, OKLAHOMA

Mr. Skeen. Please provide a description of the research that has been funded under the Animal Waste Management, Oklahoma grant.

Response. This research project is designed to develop sustainable, environmentally safe, and ecologically-sound best management principles and practices for beneficial animal waste applications for "High Plains Agriculture" in support of rural economic development through a Federal-state-local partnership. Emphasis will be placed on the rapidly expanding hog industry in the semiarid region, but information gained will also be applicable to the beef and dairy industries which play major roles in agriculture production in the region.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The Oklahoma Panhandle region and contiguous counties in the states of Colorado, Kansas, New Mexico and Texas generated $2.9 billion in sales of agricultural products in 1997. The Oklahoma Panhandle is the most productive agricultural region in the state with agricultural receipts in excess of $937 million, which represents 31 percent of the receipts in the region. The majority of sales are related to livestock production and the rapid expansion of the hog industry in this semiarid region has only strengthened that position. Oklahoma has moved to 9th in position in the U.S. for swine sales and Texas County, has risen to 3rd nationally with nearly $200 million in swine sales from a position of 645th in 1992. The rapidly expanding swine industry was projected to add $650 million in pork and value added products in Oklahoma in 1997 with the slaughter and processing of over 4 million hogs per year. The semiarid agro-ecosystem is unique with climatic conditions consisting of low rainfall that promotes both dryland and irrigated agricultural practices; extremes in high and low temperatures; soils characterized with alkaline pH, low in organic matter, and high in calcium carbonate. This unique agro-ecosystem makes information gained from more humid environments inapplicable.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this research was to develop best management practices that will protect ground water supplies from pollution of nutrients, salts, and pathogens; maintain air quality; and minimize odors derived from the entire hog-house, lagoon, land-application, soil-cropping and or rangeland production system, thus maintaining the quality of life in the rural sector. Field work has been initiated and initial work shows a positive response to animal waste applications. Initial studies of ammonia loss from applications indicate there can be significant losses following land applications.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 and the appropriation for fiscal years 1998, 1999 and 2000 is $250,000 per year. A total of $750,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. Non-federal funding from state and industry totals $659,000.

Mr. Skeen. Where is this work being carried out?

Response. This work has been initiated at The Oklahoma Panhandle Research and Extension Center located in Goodwell, Oklahoma. Further work will continue to be done at this site. The Center will provide the land area and a portion of the facilities and equipment necessary to conduct the major portion of the study. Other study sites have developed on private land in cooperation with swine operations in the panhandle region.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original completion date was February 29, 2000. To document the results for these objectives more than one growing season will be needed. Completion of these objectives and additional objectives related to these will be February 28, 2003.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project was evaluated at the end of December 1999 when the summary report of the 1998-99 accomplishments was submitted. To date seven proceedings or abstracts have been published in national or regional forums. Results to date indicate: 1) Significant amounts of ammonia will be volatilized, lost as a gas, almost immediately following effluent application to bare soils, 2) Swine effluent applications to corn, sorghum and forages demonstrate that it is an acceptable method to supply nutrients for crop production, and 3) There is a significant increase in soil phosphorus levels from application of swine lagoon sludge to soil.
This and other important technology was transferred at the High Plains Animal Water Management Conference, hosted in conjunction with the Oklahoma Panhandle Research and Extension Center, at Goodwell, Oklahoma. Those in attendance included the general public, producers, governmental officials, extension personnel and researchers from Arkansas, Colorado, Kansas, New Mexico, Oklahoma and Texas.

BIOTECHNOLOGY RESEARCH, MISSISSIPPI

Mr. Skeen. Please provide a description of the research that has been done under the Biotechnology Research Grant, Mississippi.

Response. The Agency has requested Alcorn State University to submit a grant proposal that has not yet been received. This is a new special grant for which there have been no previous awards.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The overall purpose of this project is to establish a Biotechnology Center at Alcorn State University that will focus on plant biotechnology research geared toward small farmers in Mississippi. Emphasis will be placed on improving the productivity and efficiency of crops and plants grown by small farmers in order to improve profitability and ensure long-term viability.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of the research is to enhance Alcorn State University's research efforts in biotechnology through genetic improvement research utilizing biotechnology techniques and to improve the livelihood and viability of limited-resource producers in Mississippi and the Southeast.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000 ?

Response. Preliminary work funded by the State has been underway for approximately six years. This is a new special grant and $425,000 has been appropriated for fiscal year 2000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. State funds and a $150,000 grant from the World Bank in Fiscal Year 1996 have supported this work in previous years.

Mr. Skeen. Where is this work being carried out?

Response. The research is being conducted at Alcorn State University, Lorman, Mississippi, and at field locations in Preston and Mound Bayou, Mississippi.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigator anticipates completing the original objectives of the project in two years. Additional or related objectives have not been specifically identified at this time.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. As a new special grant for which a proposal has not yet been received, this project has not yet been evaluated. A merit review panel will be convened to evaluate the project upon receipt of a proposal for fiscal year 2000.

CENTER FOR AGRICULTURE AND RURAL DEVELOPMENT, IOWA

Mr. Skeen. Please provide a description of the research that has been done under the Center for Agriculture and Rural Development program.

Response. The research monitors the final form and implementation of the Uruguay Round Agreement and evaluates its impacts on global trade and implications for U.S. agriculture.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. As the Uruguay Round ---UR--- Agreement implementation proceeds, researchers will monitor the development of these policy changes and analyze the likely impacts of these decisions with emphasis on obtaining differential impacts for developing economies, developed economies and those in transition. Researchers will also explore possible directions for the next Round or Mini-round of the World Trade Organization.

The original goal is to assess and evaluate various proposals affecting agricultural trade, to provide analytical support to the Office of the U.S. Trade Representative, and to provide information to farmers and agribusiness firms on the competitive implications of trade agreements. Theoretical studies and empirical and descriptive analyses of policy issues and technical problems pertaining to the Uruguay round of negotiations were completed and provided to negotiators and the agribusiness community. Knowledge developed in this phase is now being used to monitor the effects of the Uruguay Round Agricultural Agreement--URA.

This grant supports six projects focusing on URA and the World Trade Organization--WTO--monitoring and implementation problems; implications of the URA and WTO for Eastern Europe, Baltic, and the Newly Independent States; development of a model to assess the North American Free Trade Agreement and its linkages with the General Agreement on Tariffs and Trade; trade implications of U.S. food and development aid in developing countries; integration of China into world agricultural markets; and special projects as requested for the U.S. Trade Representative's office. Major emphasis is placed on developing and improving international livestock and grain sector models.

Mr. Skeen. How long has this work been underway and how much has been appropriated, by fiscal year, through fiscal year 2000?

Response. This research program was initiated in fiscal year 1989. Grants have been awarded from funds appropriated as follows: fiscal year 1989, $750,000; fiscal years 1990 and 1991, $741,000 per year; fiscal years 1992-1993, $750,000 per year; fiscal year 1994, $705,000; fiscal year 1995, $612,000; fiscal year 1996, $655,000; and fiscal years 1997 through 1999 $355,000; fiscal year 2000, $355,000. A total of $7,124,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: $111,210 State appropriations and $175,616 miscellaneous for a total of $286,826 in 1991; $113,779 State appropriations and $173,117 miscellaneous for a total of $286,896 in 1992; $120,138 State appropriations and $164,707 miscellaneous for a total of $284,845 in 1993; $161,000 State and $30,000 miscellaneous for a total of $191,000 in 1995; $70,000 State appropriations and $44,000 miscellaneous for a total of $114,000 in 1996; $60,325 in State appropriations and $61,5000 in miscellaneous funds for a total of $121,825 in 1997; and $72,000 in State appropriations and $75,000 in miscellaneous funds for a total of $147,000 in 1999.

Mr. Skeen. Where is the work being carried out?

Response. The research program is carried out by the Center for Agriculture and Rural Development at Iowa State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives of the project envisioned the development of models capable of providing guidance to policymakers, researchers, and farmers and others of the impact of agricultural trade proposals on the U.S. agricultural sector. As such the objectives are on-going.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. We have conducted no formal evaluations; however, each annual proposal is peer reviewed for relevance and scientific merit. Also, an informal evaluation of this project takes place as a part of each annual project review and approval process.

CENTER FOR INNOVATIVE FOOD TECHNOLOGY, OHIO

Mr. Skeen. Please provide a description of the research that has been funded under the Center for Innovative Food Technology Grant.

Response. Funds from the fiscal year 1999 grant are supporting research projects to 1) develop techniques for applying powdered material onto snack foods and shredded cheeses, 2) assess the usefulness of artificial intelligence to predict finished product quality from incoming ingredient attributes in vegetable and meat processing applications, 3) develop methods to convert the waste product whey from dairy operations into a saleable product, 4) refine the techniques for producing extended shelf life milk products in PET containers, and 5) evaluate applications for real time process control in the milling industry using Near Infrared reflectance systems. Fiscal year 1999 funds are supporting research from March.1999 through February 29, 2000. A proposal in support of the fiscal year 2000 appropriation will be requested.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The principal researcher believes the value-added food processing industry is the largest industry in Midwestern states, including Ohio where the industry contributes over $17 billion to the annual economy. From an economic development point of view, processing and adding value to crops grown within a region is the largest possible stimulus to that region's total economic product. This program aims to partner with and encourage small and medium sized companies to undertake innovative research that might otherwise not be undertaken due to risk aversion and limited financial resources for research and development in these companies. The principal researcher believes that, although the initial impact of this research will be regional, the recipient organization of this grant is part of a technology transfer network and proactively seeks opportunities to deploy technologies developed through this research to the food industry on a national basis.

Mr. Skeen. What was the original goal of the research and what has been accomplished to date?

Response. The original goal of the research was to develop innovative processing techniques to increase food safety and quality or reduce processing costs. The coatings project has developed methods to extend product shelf life while reducing costs, and the neural network project has developed a model for predicting the harvesting time that will optimize product quality and economic return to the grower, processor, and consumer. The dairy project has developed a method that allows fluid milk processors to lower their costs. The milling project has developed methods for improving quality of milled flours by developing improved process control systems.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1995. The project received appropriations of $181,000 in fiscal years 1995 through 1997, $281,000 in fiscal year 1998, and $381,000 each in fiscal years 1999 and 2000. A total of $1,586,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year 2000?

Response. In fiscal year 1995, non-federal funds included $26,000 from state funds and $70,000 from industry memberships. In fiscal year 1996, non-federal funds included $26,000 in state funds and $80,000 in industry funds. In fiscal year 1997, non-federal funds included $35,000 in state funds and $95,000 in industry memberships. In 1998, $35,000 in state funds and $105,000 in private industry memberships contributed to the support of the project. In 1999, $62,000 in State of Ohio funds, and $115,000 from private industry were used to support the project.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted in the laboratories of the Ohio State University and at various participating companies in Ohio, Illinois, and Pennsylvania.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional related objectives?

Response. The principal investigator anticipates that some projects supported by the fiscal year 2000 grant will be completed by February 28, 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An agency science specialist conducts a merit review of the proposal submitted in support of the appropriation on an annual basis. The last review of the proposal was conducted on April 15, 1999. At that time, the agency science specialist believed that the projects addressed issues relevant to food manufacturing, were scientifically sound, and that satisfactory progress was being demonstrated using previously awarded grant funds.

CENTER FOR NORTH AMERICAN STUDIES, TEXAS

Mr. Skeen. Please provide a description of the research that has been done under the Center for North American Studies program.

Response. The purpose of this grant is to develop linkages with educational and other institutions in Mexico and Canada in order to share data and faculty, conduct research identifying trade opportunities and marketing problems, conduct policy analyses, and develop a broad range of training programs preparing agricultural firms for international marketing opportunities. The research proposal was peer reviewed at the university prior to submission to CSREES.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The program director believes that citizens of the United States, Mexico and Canada have some similar concerns about the impact of the North American Free Trade Agreement, and that new, innovative approaches involving international cooperation are needed to assess and evaluate these issues. Research and training are needed to provide information to evaluate alternatives for expanding U.S. exports and to resolve potential social, economic, and environmental conflicts.

Mr. Skeen. What was the original goal of this research, and what has been accomplished to date?

Response. The goal is to promote strong agricultural ties among the three North American countries, foster greater cooperation in resolving critical agricultural issues of common interest, and ensure the continued competitiveness of U.S. agriculture. Recent research results include an investigation of technical trade barriers; a study of the impact of El Nino and La Nina on fruit and vegetable production; impacts of the North American Free Trade Agreement on livestock, meat, feed, fruit and vegetable trade; a range management watershed study along both sides of the Rio Grande River; and competitive response of Texas food marketers to the Agreement. A new publication series was started in June 1998, and four research papers were published. Recent training and education programs include a tele-video conference on International Marketing Opportunities for the 21st Century with participants in five states; and 37 seminars/workshops for producers and agribusinesses to increase the international capacity of U.S. firms was attended by over 2,600 people in 1998. Collaborative work included a workshop on International Strategic Alliances workshop developed jointly with a Mexican and a Canadian university; an expanded database on Mexican agriculture; and a video conference for a Mexican agribusiness audience.

Mr. Skeen. How long has this work been underway, and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Work supported by this grant began with an appropriation of $94,000 in fiscal year 1994; $81,000 in 1995; and $87,000 for 1996 through 2000. A total of $610,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and derived from the State of Texas for salaries and benefits. Amounts provided for this grant are as follows:

$39,000 State appropriations in fiscal year 1994; $54,000 in 1995; $60,000 per year in 1996 and 1997; $84,500 in 1998; and $80,000 in 1999.

Mr. Skeen. Where is the work being carried out?

Response. The program is being carried out at Texas A&M University through the Texas Agricultural Experiment Station in collaboration with other segments of the Texas A&M University System and Louisiana State University Agricultural Center.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1994 was for a period of 12 months. The current phase of the program will be completed in the year 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation.

Response. CSREES performed a merit review of the project in January 1999 and concluded that "the project has sound objectives and procedures for helping U.S. firms to be successful in North American markets for agricultural products, thereby achieving CSREES goals of a highly competitive agricultural production system and enhanced economic opportunity for Americans." The principal investigator is well recognized for his leadership in the area of international trade.

CLIMATE CHANGE RESEARCH, FLORIDA

Mr. Skeen. Please provide a description of the research that has been funded under the Climate Change Research grant.

Response. CSREES requested the University to submit a grant proposal which has not yet been received. Funds have not previously been appropriated for this research.

Mr. Skeen. According to the research proposal, or the principal investigator, what is the national, regional or local need for this research?

Response. The need for this research will be described upon receipt of a formal project proposal.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The research is not yet underway.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 with an appropriation of $170,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Information on non-federal funds and sources is not available.

Mr. Skeen. Where is this work being carried out?

Response. In the absence of a research proposal, location of the research can not be determined.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This will be determined upon receipt of an acceptable research proposal.

COTTON RESEARCH, TEXAS

Mr. Skeen. Please provide a description of the research that has been funded under the
Cotton Research, Texas, grant.

Response. CSREES has requested the university to submit a grant proposal for fiscal year 2000, that has not yet been received. Texas A&M and Texas Tech Universities have developed an integrated research effort to address cotton production issues using a comprehensive approach in order to strengthen the cotton industry in the high plains. Priority productions and marketing issues will be studied.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The proposed project is expected to help support a broad based program to address priority research needs of cotton grown on the Texas high plain. The specific issues will include production, processing, marketing, and utilization.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this project is to improve cotton production in West Texas and expand the demand for cotton grown in the area.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998. The appropriation for fiscal years 1998-1999 is $200,000 per year, and $170,000 for fiscal year 2000. A total of $570,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds are from the State of Texas and provide salaries and benefits for experiment station employees. Funds supporting the project were $156,000 in fiscal year 1998 and $149,000 in 1999.

Mr. Skeen. Where is this work being carried out?

Respondent. The work will be conducted at the Texas A&M University Research and Extension Center, Lubbock and Texas Technical University Campus.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The principal investigators anticipate the developmental phase of this project, which will establish priorities and provide planning for a long-term comprehensive program, should be completed in fiscal year 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project received a comprehensive review and evaluation at its inspection by Texas A&M and Texas Tech Universities and the agency National Program Leader. It will be evaluated annually throughout its lifetime.

CURRICULUM DEVELOPMENT/MISSISSIPPI VALLEY STATE UNIVERSITY

Mr. Skeen. Please provide a description of the research that has been funded under the Curriculum Development and Strengthening-Mississippi Valley State University grant.

Response. Funds were used to strengthen academic programs, including accreditation and reaccreditation. Of the ten programs eligible for accreditation, nine have been accredited. Assessment of the criteria has begun for the remaining eligible program. Academic programs have been broadened to include more agriculture-related courses consistent with the needs of students from the Mississippi Delta, students from other parts of the State, as well as out-of-state students. Curriculum additions have had a positive impact on student enrollment. Courses continue to be modified to reflect the needs of graduates as well as employers in the Mississippi Delta, with particular emphasis on those areas that employers have the greatest need. The funds continue to provide enhancements related to other program and administrative support areas that positively impact program delivery and administration at Mississippi Valley State University.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this proposal?

Response. The primary need for this project is to satisfy a local need. The need is for strengthening university capacity and curriculum development at Mississippi Valley State University. Degree programs in Accounting, Mass Communications and Public Administration have been added since the 1988 plan was developed. The Criminal Justice program has been developed into a departmental unit with social work in order to provide for improved administration and academic counseling. A master's program in Criminal Justice is now offered. The baccalaureate major in chemistry and the master's program in Elementary Education have been reinstated.

Mr. Skeen. What was the original goal of this project and what has been accomplished to date?

Response. The original goal was to provide funding to strengthen the academic programs of the university. This funding has strengthened the fiscal and academic areas of the university. The University's cash flow and cash availability have remained steady and sufficient all year long. Student recruitment has improved to show a positive ratio between applications received and students admitted. Approximately one half of the applicants are

enrolled. Increased quality of instruction and programs have benefitted students. This is reflected in the higher graduation rate, increased student enrollment, enriched faculty and improved community relationship.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. This program was initiated in fiscal year 1987. Grants have been awarded from funds appropriated as follows: fiscal year 1987, $750,000; fiscal years 1988 and 1989, $625,000 per year; fiscal year 1990, $617,000; fiscal year 1991, $642,000; fiscal years 1992 and 1993, $668,000 per year; fiscal year 1994, $593,000; fiscal year 1995, $544,000; fiscal years 1996-2000, $583,000 per year. A total of $8,647,000 was appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Mississippi Valley State University received State and private funding during the period of this grant. The State figures provided here are for enhancement funds gained above the University's standard formula generated funds. The sources and amounts are as listed:

	SOURCE		
FY	State	Private	Total
1987	$ 0	$168,640	$ 168,640
1988	0	186,036	186,036
1989	68,658	190,258	258,916
1990	207,879	369,358	577,237
1991	333,263	337,700	670,963
1992	349,427	470,220	819,647
1993	35,750	358,680	394,430
1994	590,890	568,970	1,159,860
1995	841,654	530,300	1,371,954
1996	1,197,917	590,824	1,788,741
1997	309,717	755,629	1,065,346
1998	313,738	538,423	852,161
1999	909,419	389,812	1,299,231

Mr. Skeen. Where is this work being carried out?

Response. These funds are intended to strengthen programs at Mississippi Valley State University. The program has been carried out on the campus at Itta Bena and at off-campus sites in Anguilla and Greenville and the Greenwood Center since the Spring Semester of 1996.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives completion date was June 1992, and the primary objective of erasing the financial deficit was accomplished at that time. The university has been operating on a sound financial basis as of July 1993. Academic program strengthening has progressed very well. The objectives of the current grant will be completed by September 30, 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The program staff in the agency conducts an annual evaluation of reports submitted by the principal investigator. The evaluation reflects steady enhancement in curriculum development and improved support for strengthening administrative units. The Department of Education doubled efforts to seek two new programs at the undergraduate level in the areas of Special Education and Early Childhood. The department enhanced the faculty through two fronts-technology upgrade and scholarship. A number of technology workshops were provided for faculty in collaboration with the Institute for Effective Teaching Practice. These workshops were aimed at helping faculty to incorporate technology into their teaching. In pursuance of the National Council of Accreditation of Teacher Education --- NCATE --- accreditation visit in year 2000, the department undertook a series of activities aimed at enhancing the teacher education programs as well as ensuring reaccreditation. These activities included: attending American Accreditation of Colleges for Teacher Education --- AACTE --- and NCATE national meetings, revisiting and reassessing curricular and programmatic requirements. Core Curriculum has received special attention during the year. Annual revisions were completed for all core courses in each discipline. Strong emphasis was placed on Writing Across the Curriculum. The University Testing Center has undergone significant growth. Staff development has continued in technology utilization skills. Since more standardized tests are becoming computer-based, the Center has developed a plan for increased computer testing.

DATA INFORMATION SYSTEM

Mr. Skeen. Please provide a description of system development activities that have been funded.

Respondent. CSREES continues to fund activities under contract with a major information technology firm for the design and development of the Research, Education, and Economics Information System ---REEIS---. Previously funded tasks that have been completed include the conduct of an inventory of databases targeted for inclusion in REEIS; a comprehensive assessment of information needs and practices within the Research, Education, and Economics mission agencies and State partner institutions; design and development of a Web accessible catalog of databases identified in the inventory; a comprehensive review of state-of-the-art information technology systems available for use in developing the system; and design and development of a REEIS proof-of-concept prototype that is currently undergoing critical review and evaluation. An additional task was completed under a separate contract that provided for an outside expert to conduct a review and evaluation of Web interfaces to the REEIS Database Catalog. Also, a cooperative agreement with the University of Arkansas was also established to provide national leadership in coordinating the efforts a National Steering Committee charged with guiding the continuing development of the system. The Committee has met on a regular basis with the next meeting planned for August, 2000. Currently underway, and critical to the development of REEIS, is a comprehensive interagency data modeling effort designed to identify and describe data, data relationships, and sources of data from across the research, extension, education, and statistics domains of the Research, Education, and Economics mission agencies and State partner institutions. This will serve as the basis for the development of alternative system architectures and the population of the REEIS prototype with actual data from selected core databases that are to be included in REEIS. Funding has also been provided under the REEIS initiative for the design and development of an Evaluation and Accountability System for Extension ---EASE--- which has been targeted for linkage in REEIS.

Mr. Skeen. What is the national, regional or local need for this activity?

Respondent. At present, USDA's Research, Education, and Economics ---REE--- mission agencies and their university partners lack a central, integrated, user-friendly electronic information system capable of providing access to thousands of programs and projects for which they are responsible that focus on food, agriculture, natural resources, and rural development. Such an information system is increasingly needed to enable the Department and its partners to readily conduct baseline and ongoing assessments and evaluations of research, education, extension, and economic programs and projects. In recent years, this need has become more urgent for several reasons. First, the United States needs a visionary publicly funded research and development program to produce essential knowledge and innovations for meeting growing competition in a global market -- which is largely attributable to the expanding research and development efforts of foreign nations. Second, a comprehensive information system is needed to serve as a primary reference source for development of new research and education programs on such diverse issues as increasing productivity in agriculture and processing, improving the safety and quality of food, and enhancing the sustainability of the environment and rural communities. Third, Federal/State policy makers and administrators are requiring empirical analyses to account for historical, current, and future use of public funds to provide a basis for redirecting funds to higher priority issues. Fourth, the Government Performance and Results Act ---GPRA--- has imposed reporting demands which current databases and decentralized information systems are not prepared to adequately satisfy. It is also envisioned that REEIS will play a key role in implementation of the Agricultural Research, Extension, and Education Reform Act ---AREERA--- of 1998. In this regard, REEIS would be well-positioned to:

- Provide linkages for decision making among REE agencies,
- Enable consistent reporting on identical or similar issues,
- Provide the public with understanding of the role and mission of REE agencies,
- Expand REE's outreach to a broader base of constituencies,
- Provide a better vehicle to facilitate interaction among REE agencies and their university partners,
- Link commonalities of research, extension, and teaching projects and programs through a single interface, and
- Foster global interactions.

Additionally, REEIS will serve to expand the Federal partnership by facilitating coalition-building with other Federal agencies.

Mr. Skeen. What was the original goal of this initiative and what has been accomplished to date?

Respondent. The original goal of this initiative was to develop an information system that provides real-time tracking of research, extension and education projects and programs; has the capability to communicate vertically between field, State and Federal locations; enables the REE agencies and their partners to conduct rapid and comprehensive policy assessments and program evaluation analysis; facilitates assessment of technologies and practices employed in extension, education, economics, and research activities at the field and/or regional levels; provides clear and transparent public access to relevant parts of the information; and provides information management tools to enhance the timeliness and accuracy of REE-wide responses to inquiries about program objectives and expenditures.

Since launching of the REEIS initiative, substantial system planning and development work has been completed. Work accomplished under a series of multi-task contracts with a private sector information technology firm was instrumental in meeting major milestones considered to be critical components and a prerequisite to the design, development, and implementation of REEIS. Major tasks included the conduct of a comprehensive strategic information audit of information practices and needs within the REE agencies and partner institutions; the identification and inventory of major research, extension, education, and economics/statistics databases maintained or supported by the REE mission agencies; the design, development, and preparation of the REEIS Database Catalog Prototype that affords Web access to the inventory of 38 databases initially identified as candidates for inclusion in REEIS; the design and evaluation of the Web interface to the REEIS Database Catalog; a comprehensive review of state-of-the-art information technology systems available for use in developing REEIS; and the design and development of a Web accessible REEIS proof-of-concept prototype.

Plans in fiscal year 2000 include the development and assessment of alternative system architectures, development and testing of a REEIS prototype populated with actual data from selected core databases, updating and maintenance of the Information Systems Technology database and the REEIS Database Catalog, and initial implementation and operation of the REEIS system, including training of REEIS users and technical system operators.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Respondent. Congress first appropriated $0.4 million for REEIS in FY 1997 to begin planning its design and development. The FY 1998 appropriation was $800,000. This was followed by appropriations of $1.0 million in FY 1999 and $2.0 million in FY 2000. A total of $2.25 million is requested in FY 2001.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Respondent. Non-federal funding does not apply at this time.

Mr. Skeen. Where is this work being carried out?

Respondent. Leadership responsibility for REEIS resides within the CSREES Science and Education Resources Development unit. This provides for effective linkage within the REEIS platform of the Current Research Information System, the Food and Agricultural Education Information System, and other appropriate research, extension, education, and statistics databases. The REEIS leadership works closely with the four Research, Education, and Economics mission agencies and the university system to ensure that primary users as well as key stakeholders are involved in the REEIS development process. A sizeable effort continues under contract with a major private sector information technology firm for the design, development, testing, and implementation of REEIS. One staff person assigned full time to manage and coordinate agency contracting activities currently serves as the REEIS technical information program manager. Plans are to recruit for the positions of a REEIS Director and a support staff person in FY 2000, followed by computer and technical information specialists in future years to operate and maintain the system.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Respondent. It is anticipated that REEIS will become operational during FY 2000. The requested increase for FY 2001 is required to achieve broad implementation. Included is the need to conduct ongoing, iterative needs assessments within the mission area and with its partners to align information system products and services with strategic information requirements necessary for meeting agency mission and goals and satisfying GPRA reporting requirements. Updating and maintenance of technical system assessments, conducting ongoing information technology evaluations, and enhancements of REEIS user interfaces will be essential to ensure currency and responsiveness over the life of the system. The additional funding will allow also for the enlistment, training, and retention of essential personnel and staff and provide for the enhancement of several legacy systems and databases to permit effective inclusion in REEIS.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Respondent. Progress and accomplishments stemming from the REEIS initiative have undergone and continue to undergo review and evaluation by the REE mission agencies, the REEIS National Steering Committee, our State partner institutions, and outside sources. The most recent evaluation of the project was conducted in December, 1999 by a Department-wide information technology review board which approved the project for continued support as a mission-critical system. Factors considered in the evaluation included REEIS system objectives, its support of mission area strategic goals, strategies for managing risk, the degree of return on investment, and the level of support for the Secretary's priorities. An earlier evaluation of this project was conducted at the June, 1999 meeting of the REEIS National Steering Committee, comprised of representatives of the REE mission agencies, university partners, and key stakeholders. Committee members were presented the opportunity to critique the REEIS proof-of-concept prototype in terms of its potential for responding to primary users, satisfying primary uses, and meeting priority system requirements. An interagency REEIS team is in the process of performing technical evaluations of a series of successive iterations of the prototype. In May, 1999 a two-day REEIS retreat was held to review project status and make recommendations as to future tasks for the development and implementation of the system. Based on participant recommendations, a comprehensive interagency data modeling effort is underway to identify and describe in detail data and sources of data that are to be included in REEIS and which reside within the research, extension, education, and statistics domains of the Research, Education, and Economics mission agencies and their State partner institutions. A review by REE agency policy officials, budget and GPRA staff, national program leaders, and senior managers of the final set of system requirements resulting from the needs assessment was completed in February, 1999.

GEOGRAPHIC INFORMATION SYSTEMS

Mr. Skeen. Please provide a description of the research that has been funded under the geographic information system program.

Response. The purpose of this program is to promote collaborative and innovative transfer of systems technologies to state and local governments and others in the public and private sectors. The current program is being carried out by the non-profit National Consortium for Rural Geospatial Innovations in America---NCRGI. The directors and participants of the Consortium are the sub-contractors who are carrying out the program by working on agro-environmental problems at the national, regional, state and neighborhood levels. They represent a wide spectrum of site-based expertise

including six academic institutions, one regional development authority, and the Southwest Indian Polytechnic Institute site added by Congress in 1997. This institutional arrangement has helped fill a role in linking some of the otherwise disparate efforts of agencies and academic institutions to apply them in the now seven regions of the country.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher believes that local officials are facing increasingly complex land management issues that require rapid access to resource knowledge and databases for decision making. This project is needed to transfer relevant technology to state and local governments, including Native American communities whose limited training budgets and sometimes-isolated location, make it difficult to use the latest technology. The technology developed by the Consortium is useful in improving the management of natural resources. While concentrating on issues related to agriculture, the independent, non-profit nature of the National Consortium for Rural Geospatial Innovations in America facilitates linkages across disciplinary and institutional barriers, and makes it possible to use analyses at the state and local levels which were initiated at the federal level. While the early phases of the geographic information system concentrated on building information systems related to rural, physical, and natural resources, the current challenge is to integrate human economic, social and demographic information in order to better understand the relationship of human communities to the landscape. At the other end of the spatial scale, the role of the public sector in geographic information system-based precision farming technologies, data capture, and information synthesis is the subject of a current study group.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this work was to serve as a pilot project for the transfer of geographic information systems technology related to natural resources to local governments.

The Consortium has carried out this function. Economic and biological data are being presented in various formats to state and local governments and individuals. Through its 7 regionally distributed sites, including the new Southwest Indian Polytechnic Institute site in New Mexico, the Consortium has implemented a variety of geographic systems technologies to local governments--both rural and urban. These include the recent expansion of transfer of geographic information technology through various distance education and Internet technologies.

It is anticipated that the fiscal year 2000 grant will support work under this program through March 2001. The proposal for this work in 1999 has been received and reviewed.

Mr. Skeen. How long has this work been under way and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1990, $494,000; fiscal year 1991, $747,000; fiscal years 1992 and 1993, $1,000,000 per year; fiscal year 1994, $1,011,000; fiscal year 1995, $877,000; fiscal year 1996, $939,000; fiscal years 1997 through 1999, $844,000 per year; and fiscal year 2000, $850,000. A total of $9,450,000 has been appropriated since the beginning of the program.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. For fiscal year 1990 through fiscal year 1997, to date, the work in this program had $5,009,834 in non-federal support. In fiscal year 1990, non-federal support was $714,940 consisting of equipment, databases, and other miscellaneous contributions from foundations, city, and state governments. In fiscal year 1991, non-federal support was $25,000 from county government. In fiscal year 1992, non-federal support was $366,016 from county government, computer companies, and state governments consisting of equipment, software, facilities, and miscellaneous support. In fiscal year 1993, non-Federal support was $713,900 consisting of financial and miscellaneous support from foundations, county and state governments. In fiscal year 1994, the non-federal support was $713,643. In fiscal year 1995, the non-federal support was $987,000. In fiscal year 1996, it was $567,173. It was $456,582 in fiscal year 1997. In 1998 and 1999, non-federal dollars exceeded $1,000,000, and it is anticipated that they will again in 2000.

Mr. Skeen. Where is this work being carried out?

Response. The National Consortium for Rural Geospatial Innovations in America is administratively centered at the University of Wisconsin-Madison. The University of Wisconsin-Madison, functioning as the Great Lakes center, continues a long history of involvement in the application of this technology at the local level with strong focus on soils/land-use and the institutional aspects of the integration of a new technology. The southeastern center in Valdosta, Georgia, in affiliation with the South Georgia Regional Development Center, has developed a comprehensive plan of the City of Adel as a model for other urban centers in the ten-county region. The southwestern center, in Fayetteville, Arkansas serves several local governments through its training facilities at the University of Arkansas, basing its technical approach on expertise and past experiences with the Federally developed system known as GRASS. They have developed pilot projects for some local jurisdictions and state level databases, which they have provided online. Central Washington University focuses on training for state planning and on three local governments and the Yakima Nation in the Yakima watershed. The north central center in Grand Forks, North Dakota, in affiliation with the University of North Dakota, focuses on relating real time weather data to other spatial attributes. The University of Wisconsin-Madison, functioning as the Great Lakes and Administrative center, continues a long history of involvement in the application of this technology at the local level with strong focus on soils/land-use and the institutional aspects of the integration of a new technology. Native American communities are being reached through the newly-developed Southwestern Indian Polytechnic Institute facilities in Albuquerque, New Mexico. Two new sites were added in fiscal year 99. They are Pennsylvania State University and the GIS Consortium at Wilkes University and Kings College in Pennsylvania. These two sites have replaced the NCRI-Chesapeake site and will be involved in providing GIS solutions to environmental problems that local government and regional planning commissions are dealing with in the Upper Susquehanna/Lackawanna Watershed.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objectives to build institutional frameworks for developing and disseminating geographic and related information to local decision makers is constantly evolving. Each site has developed approaches to addressing regional needs for modern technologies, and many innovative

applications have been implemented. Technologies, including Internet-based educational and information exchange, have been developed to respond to the Consortium's customers. The Consortium has been asked to include these new technologies in order to bring its primarily rural users into new eras of public education and information management.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Proposals have been internally reviewed by Departmental personnel in different agencies. Beginning in 1995, the program has also been externally reviewed by local advisory committees and qualified professionals inside and outside of government. Their various comments and suggestions are sent to the agency and have helped with the favorable merit reviews.

GULF COAST SHRIMP AQUACULTURE

Mr. Skeen. Please provide a description of the research that has been funded under the Gulf Coast Shrimp Aquaculture grant.

Response. The agency requested that the Oceanic Institute, and the Gulf Coast Research Laboratory submit a grant proposal that is currently under review. Recent research has addressed three major areas of research including: stock improvement; disease control; and sustainable culture technology. A number of important viral pathogens of marine shrimp have been identified and protocols have been established for the detection of viral pathogens that have decimated the shrimp industry world-wide. Improved viral detection techniques have led to the development of specific pathogen-free stocks of commercial importance. Researchers have responded rapidly to the multiple viral diseases that have significantly impacted the United States shrimp farming industry. Researchers will intensify efforts aimed at preventing new introductions of exotic viral pathogens both in commercial and wild shrimp stocks.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The principal researcher indicates that there is potential to enhance domestic production of marine shrimp through aquaculture in order to reduce the approximately $3 billion annual trade deficit in marine shrimp. Research continues to improve the supply of high quality seed, improve shrimp health management, improve biosecurity and environmental protection, and enhance production efficiency in shrimp culture systems. The United States has the opportunity to become a major exporter of shrimp seed and broodstock, disease control and biosecurity technologies, products, and services.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal was to increase domestic production of marine shrimp through aquaculture. Researchers have responded to severe disease outbreaks caused by the introduction of exotic viral pathogens into United States shrimp farms and recent studies have focused on the prevention and detection of shrimp viral diseases which have decimated domestic commercial production. Production of specific-pathogen free and specific-pathogen resistant seed and broodstock, biosecure and environmentally compatible productions systems, and improved feeds and feeding strategies for broodstock maturation and larval production will all enhance United States production technology while preventing the introduction of exotic pathogens into commercial and wild shrimp stocks. Diagnostic and disinfection techniques for

a number of important viral pathogens have been developed. In addition, scientists are developing high-health genetically improved stocks and evaluating these animals under commercial production conditions.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. Grants have been awarded from funds appropriated as follows: fiscal year 1985, $1,050,000; fiscal year 1986, $1,236,000; fiscal year 1987, $2,026,000; fiscal year 1988, $2,236,000; fiscal year 1989, $2,736,000; fiscal year 1990, $3,195,000; fiscal year 1991, $3,365,000; and fiscal years 1992-1993, $3,500,000 per year; fiscal year 1994, $3,290,000; and fiscal year 1995, $2,852,000; fiscal year 1996, $3,054,000; and fiscal years 1997 through 2000, $3,354,000. A total of $45,456,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The United States Marine Shrimp Farming Consortium estimates that non-federal funding for this program approaches 50 percent of the Federal funding for fiscal years 1991-2000. The source of non-federal funding is primarily from state and miscellaneous sources.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out through grants awarded to the Oceanic Institute in Hawaii and the Gulf Coast Research Laboratory in Mississippi. Research is also conducted through subcontracts with Tufts University, the Waddell Mariculture Center in South Carolina, the Texas Agricultural Experiment Station, and the University of Arizona.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original specific research objectives was 1987. The original specific objectives have been met, however new challenges to the United States farm-raised shrimp industry continue the need for shrimp culture research. Researchers anticipate that the specific research outlined in the current proposal will be completed in fiscal year 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project proposal is reviewed annually by the agency's Program Managers and the Program Specialist and is consistent with United States Department of Agriculture guidelines. Participating institutions are required to submit a detailed accomplishment report with the submission of each new grant proposal. The 1999 review of the program found that the progress during the last twelve months has been well documented and the proposal is well written. Research objectives are being met and the proposed research is consistent with the National Science and Technology Council's Strategic Plan for Aquaculture Research and Development. Facilities and expertise are very good and the close linkages between the researchers involved and the United States shrimp farming industry has greatly enhanced the commercialization of the research findings from this project. The United States Marine Shrimp Farming Project continues to address important research needs of the industry and has played a critical role in developing management

strategies for protecting both wild and cultured stocks from the introduction of viral pathogens. The agency conducted an on-site review of this program in October, 1999. The agency is awaiting the final report of the review team.

LIVESTOCK MARKETING INFORMATION CENTER, COLORADO

Mr. Skeen. Please provide a description of the research that has been done under the Livestock Marketing Information Center program.

Response. This is a new project and Colorado State University is submitting its first grant proposal in fiscal year 2000. The project will enhance the ability of the Center to provide objective analyses of livestock markets and make recommendations to livestock producers.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Recent changes in the structure of the livestock industry and in farm legislation have forced producers to pay more attention to market signals. Market prices have become more volatile because of changing domestic and international markets, thereby increasing producers' need for high quality market information and interpretation.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal is to increase the ability of livestock producers to make good business decisions in a changing global economy.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by the grant begins in fiscal year 2000 with an appropriation of $170,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The Center includes a consortium of faculty from 22 universities; participating universities contribute about $170,000 of non-federal funds a year.

Mr. Skeen. Where is this work being carried out?

Response. The work will be carried at the Livestock Marketing Information Center, Denver, Colorado in cooperation with Colorado State University and 21 other universities.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives and duration of the project will be specified in the grant proposal to be submitted in fiscal year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This is a brand new project. CSREES will carefully review the proposal when it is received.

MARICULTURE , NORTH CAROLINA

Mr. Skeen. Please provide a description of the research that has been funded under the Mariculture, North Carolina grant.

Response. The agency requested that the university submit a grant proposal that has yet to be received. The long-term goal of the project is to develop methods for mass propagation of marine finfish for commercial cultivation and possible stock enhancement. Specific objectives include development of growout technologies from juvenile to marketable stages and broodstock husbandry practices of selected marine species including the southern flounder and the black sea bass.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The Principal Investigators forecast an increasing need for the development of aquacultural production systems and methodologies for a variety of marine finfish. Results from this research will have broad application in the identification and development of marine species with commercial potential in the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research program is to develop sustainable aquaculture production systems for marine finfish. Captive mutton snapper were successfully matured and spawned and the resulting larvae reared through the juvenile stages. Juveniles were supplied to commercial and governmental organizations for commercial grow-out trials. Initial results appear promising with good survival rates and excellent feed conversion ratios. Captive-spawned mutton snapper are currently being raised to maturity and methods are being evaluated to control gonadal maturation through temperature and light manipulation and hormone treatment.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998. The appropriation for fiscal year 1998 was $150,000, and for fiscal years 1999 and 2000, $250,000 was made available. A total of $650,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The university estimates that approximately $115,000 of non-federal funds were provided for this project in fiscal year 1998 and $61,941 were provided for fiscal year 1999. These funds came primarily from state and private sources.

Mr. Skeen. Where is this work being carried out?

Response. The research will be conducted at the Center for Marine Science Research at the University of North Carolina at Wilmington.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The project was initiated in fiscal year 1998. The original goals continue to be addressed. The anticipated completion date for the current proposal is fiscal year 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The Program Managers and Program Specialist evaluate the progress of this project on an annual basis and is consistent with United States Department of Agriculture guidelines. The proposal is well-written and the objectives are clearly stated. The methodology and experimental design are sound. The research is relevant and addresses a potential opportunity for the aquaculture industry. Facilities are excellent and have been enhanced through this program. The research team is well-qualified and has the appropriate background. Literature and justifications for research are provided.

NATIONAL CENTER FOR PEANUT COMPETITIVENESS

Mr. Skeen. Please provide a description of the research that has been done under the National Center for Peanut Competitiveness grant.

Response. The grant supports an interdisciplinary research and education program to enhance the competitiveness of the U.S. peanut industry by examining alternative production systems, developing new products and new markets, and improving product safety.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. Peanuts are a very important crop in several southern states. In many counties, peanuts provide more than 50 percent of all crop income. Peanut producers have been major beneficiaries of government income protection programs, but Federal farm and trade policies are changing and producers must become more competitive and market oriented.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The project helps peanut producers be more competitive in the global market. Recent results include: economic feasibility analyses of alternative production and risk management practices; a computerized expert system adapted for hand-held computers to help farmers reduce pest control costs; the addition of economic factors to a computerized disease risk management system. The Center attracted some additional funding from other sources to purchase hand-held computers to run the pest management program for a number of producers.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998. Appropriations have been as follows: $150,000 in 1998; $300,000 in 1999; and $300,000 in 2000. Total appropriations to date total $750,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are as follows: in fiscal year 1998, the state of Georgia contributed $141,181 and the state of Alabama, $15,000; in 1999, the state of Georgia contributed $504,354 and the state of Alabama, $67,553.

Mr. Skeen. Where is this work being carried out?

Response. The Center is located at the University of Georgia at Griffen and involves cooperators from nearby peanut producing states, such as Auburn University in Alabama.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1998 was for a period of 36 months, however, the need to improve the competitiveness of U.S. peanut growers continues to grow. The current phase of the program will be completed in 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in August 1999, when it evaluated the current year's project proposal, and concluded that "the project has sound objectives and procedures for helping the U.S. peanut industry become competitive, thereby contributing to the CSREES goals of a highly competitive agricultural production system and enhanced economic opportunity for Americans." The principal investigator and other faculty named in the proposal are recognized for their leadership in the industry.

PM-10 STUDY, CALIFORNIA AND WASHINGTON

Mr. Skeen. Please provide a description of the research that has been funded under the PM-10 study, California and Washington research grant.

Response. The PM-10 study in California and Washington addresses the effects of emissions of PM-10 and PM-2.5 sized particulates, or dust, from agricultural land on air quality and development of control strategies. These studies are being conducted by scientists at the University of California-Davis and the Washington State University, in cooperation with Federal, state, and local agricultural, environmental, and health agencies, and farmers and growers in both states. The California program has focused on developing and refining methods to accurately measure and detect the sources of PM-10 and PM-2.5 emissions from various agricultural susceptible California crops and soils. In addition, the California research has been expanded to include dust and gaseous emissions from cattle feedlots, dairies, and poultry industry. This is related to livestock operations. The Washington State University scientists are using refined instruments on field sites to measure and predict the effects of wind erosion and agricultural practices in the Columbia River Basin region on PM-10 and PM-2.5 emissions, under both natural wind erosion and with portable wind tunnel studies. Alternative cropping and tillage practices, residue management, and weed control practices are being developed and compared for control of PM-10 and PM-2.5 emission pollution under Columbia River Basin conditions.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. There has been growing national concern over the potential health and safety aspects of air pollution from dusts and suspended particulate matter resulting in passage of the 1990 Clean Air Act, as well as state air quality laws in both California and Washington. Because of particular problems from PM-10 and PM-2.5 emission in the arid regions of the Western United States, research on the role of agricultural operations in intensively cultivated soils in California and the Columbia River Basin, as sources of PM-10 and PM-2.5 emissions.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goals of this research were to measure the PM-10 emission rates from significant crop and tillage practices, to determine the source of PM-10 emissions on soils in agricultural regions of central and southern California and the Columbia River Basin in the Pacific Northwest, and to explore cost-effective alternative agricultural practices to control these emissions. More recently, studies of finer PM-2.5 particulates have been included because of their recognized potential health risks. In California, field measurements are being continued on both PM-2.5 and PM-10 emissions on production practices on almonds, figs, walnuts, cotton, wheat, and on ammonia emissions from dairy farms and feedlots. Similar studies in the Columbia River Basin are being conducted in Washington on a number of agricultural practices in the rain-fed and dryland croplands. Susceptible climatic and soil conditions and tillage and cropping practices have been identified and are being used to develop prediction tools to assist growers to adopt alternative practices to reduce potential air pollution by PM-10 and PM-2.5 particulate emissions. During 1998 an intensive study was undertaken to evaluate emission differences in almond harvesters. Data has been taken in California to assess land preparation techniques.

A Light Detection and Ranging system has been developed at the University of California at Davis that makes it possible to take a snapshot of the shape of an emission plume from a source such as a harvester, and to make estimates on the amount of particulate material emitted into the atmosphere and its subsequent transport. Efforts continue to calibrate the Light Detection and Ranging System.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in March 1994. The appropriation for fiscal year 1994 was $940,000; fiscal year 1995, $815,000; and for fiscal years 1996 through 2000, $873,000 per year. A total of $6,120,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. In California, the program is matched by State funds in the form of salaries, benefits, and operating costs. In Washington, there were no state or non-federal funds in support of the PM-10 project in 1994 and 1995. In 1996, state support was $22,566, and in 1997, state support was $102,364. Similar funding was continued in 1998 and 1999.

Mr. Skeen. Where is this work being carried out?

Response. This work is being directed by participating scientists at the University of California-Davis and at the Washington State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date of the original objectives of this project is 2000. The first four objectives of the project on soil particle characterization are anticipated to be completed in 1999. The objectives on field control will continue. In 1998, a manual for practices was developed and circulated for use by growers in Washington State to reduce wind erosion on agricultural land. Implementation and development of these management practices will be a major role of this project in the future. Quarterly and annual reports on the Washington State project to date are available.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency's Program Manager annually reviews the research progress reports and proposed new research and attends the annual meetings of the program to assess progress. The program is also evaluated each year by technical, administrative, and agency personnel. Progress is reported at research review meetings three times a year, with the November 1998 advisory committee members. A formal on-site review by a panel of experts was conducted of the Washington program in November 1997, and a similar review of the California program is planned in the near future.

PRECISION AGRICULTURE, ALABAMA AND TENNESSEE

Mr. Skeen. Please provide a description of the research that has been funded under the Precision Agriculture, Alabama and Tennessee grant.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received. This grant will develop needed training for farmers in the use Global Positioning Systems, Geographical Information Systems, Remote Sensing and Variable Rate Technology for precision farming application.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. This project will focus on the Southeastern area of the U.S. However results will apply to anywhere precision farming is applied.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of this project is to provide training for farmers in the use of precision farming technology.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and is funded at $425,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. This is a new project and therefore no non-federal funds have been provided.

Mr. Skeen. Where is this work being carried out?

Response. The project will be conducted at the United States Space and Rocket Center Huntsville, Alabama and the Tennessee Valley Research and Extension Center at Belle Minci, Alabama.

Mr. Skeen. When was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives was fiscal year 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. This project is under development and has not yet been evaluated.

WATER QUALITY - ILLINOIS

Mr. Skeen. Please provide a description of the research that has been funded under the water quality program grant.

Response. The Illinois Groundwater Consortium grew out of a fiscal year 1990 appropriation of $500,000 to Southern Illinois University at Carbondale to focus on the short- and long-term effects of agricultural chemical contamination on the environment, the groundwater, and ultimately, human health and welfare. As a result of this appropriation, the University joined forces with the Illinois State Geological Survey, Illinois State Water Survey, the University of Illinois Cooperative Extension Service, and the University of Illinois Agricultural Experiment Station to create the Illinois Groundwater Consortium. The Consortium's primary mission, then and now, is to work effectively toward providing a scientifically-valid basis upon which meaningful agricultural chemical management and regulatory decisions can be based. The Consortium has worked to address the concerns of the agricultural and agrichemical industries as well as the valid concerns of the agencies charged with protection of environmental quality. Projects supported with Consortium funding are peer reviewed by researchers at 35 different universities and agencies from across the Nation, and results are presented and critiqued annually at the Consortium's Research Planning Conference.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. The fiscal year 1998 appropriation was targeted to research pertaining to the impacts, recovery, and remediation of the Midwestern region after flooding. The 1993 and 1995 flooding of the Mississippi, Missouri, and Illinois Rivers, and their tributaries, created devastating effects on the farm lands, communities, and natural resources of the area. These effects have major implications for agricultural practices, water quality, and public policy decisions. This natural catastrophe has resulted in a need for further

studies examining the impact of the flooding on surface/groundwater, soils and their rehabilitation, biodiversity, and on economic and public policy in the region. In addition, there is the need to disseminate results to the public to enable the Consortium findings to be beneficial in the near term to those needing the information. To facilitate this work, the Consortium expanded its participant institutions to include Southern Illinois University at Edwardsville. Southern Illinois University at Edwardsville's strategic location in the heart of the flood damage area, as well as its qualified research scientists who work in the Consortium's high priority research areas, strengthen the capabilities of the Consortium. The highest priorities of the Consortium are: (1) the funding of research upon which public policymakers working on land use or groundwater protection issues in flood plain areas can base decisions and (2) the broad dissemination of this information. The projects funded by the Consortium are providing researchers opportunities to obtain data upon which larger projects can be built. Without this initial data, funding from other competitive sources would be difficult to obtain. The Consortium has tried to expand its efforts through a proposal for funds from the Fund for Rural America. This application received good feedback but was not funded. A revised proposal to similar funding sources is planned in the continuing efforts to expand the basic and applied impacts of the Consortium's research.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The Illinois Groundwater Consortium was established to coordinate and support research on agricultural chemicals in Illinois groundwater. The recent Midwest flood of the Mississippi, Missouri, and Illinois Rivers, and their tributaries, created devastating effects on farm lands that have major implications for agricultural practices and water quality in the region as well as effects in other states in the Midwest. The Consortium would like to be a leader in providing information to facilitate short-term and long-term systems studies of the effects of flooding on groundwater and surface water upon which to base policy management decisions. Research areas characterizing short-term and long-term projects completed, underway, or proposed for each research area include:

Short-Term

- Effect of extended inundation on soil productivity
- Movement of chemicals --- pesticides, herbicides, heavy metal, other chemicals --- from flooded soils into surface and groundwater
- Impacts on soil fertility and nutrient balance caused by flooding
- Changes in nitrogen-fixing bacteria or pesticide microbic activity due to flooding
- Impacts of flooding on plant and aquatic life, including endangered and dangerous species, and microbial communities
- Effectiveness of riparian buffer strips under flooded conditions
- Groundwater quality changes resulting from flood related land-use developments in both the bottomlands where farming practices change and in the uplands where new communities are being developed

Long-Term

- Effectiveness of methods of remediation for flooded soils
- Changes in surface and groundwater quality over time with changes in flooding conditions
- Changes in soil chemistry and productivity over time

- Long-term effects and recovery of microbic activity
- Effects of time on recovery --- and eradication --- of plant and aquatic life
- Recommendations for long-term, systems-based planning and management for watershed and bottomland management
- Examination of public policy decisions with implications for agriculture and water quality in light of flooding effects and recovery
- Long-term implication for public policy decisions and management of the river systems

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Research grants have been awarded from funds appropriated as follows: fiscal year 1990, $494,000; fiscal year 1991, $600,000; and fiscal years 1992-1993, $750,000 per year; fiscal year 1994, $666,000; fiscal year 1995, $460,000; fiscal year 1996, $468,000; fiscal years 1997 and 1998, $465,000 per year; and fiscal year 2000, $297,500. A total of $5,415,500 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant were as follows: $255,891 state appropriations in 1991; $447,237 state appropriations in 1992; $644,054 state appropriations in 1993; and $623,124 state appropriations in 1994. Non-federal and state funds for 1995-1997 have exceeded the federal funds.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out by the Illinois Groundwater Consortium and coordinated by the Carbondale campus of Southern Illinois University. The research is being conducted by staff at the University of Illinois, Southern Illinois University-Carbondale, the Southern Illinois University-Edwardsville, the Illinois State Geological Society and the Illinois State Water Survey at locations across the State of Illinois and in Missouri.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. This project was planned as a 5-year study of the impacts and recovery of flooding in the Midwest. In the original proposal and subsequent proposals, we identified both short-term objectives which are project goals that could be accomplished within 1-2 years and long-term objectives which are project goals that could be accomplished within 2-5 years. In calendar year 1997, we completed 3 years of studies involving 26 projects, and in calendar year 1998, we began 4 new projects and continued 12 projects. These projects were spread across areas identified as high priority, including studies of flood impacts on soil productivity and remediation, movement of chemicals in water and soils, bacteria and microbial life, plants and aquatic life, and on public policy impact. Results of projects completed in previous years and progress reports on projects underway are published each year as part of the Proceedings of the annual conference of the Illinois Groundwater Consortium and in the Illinois Groundwater Consortium's Groundwater Bulletin. Dissemination of both of these publications is broad-based, utilizing mailing lists to public and private institutions and individuals kept by the

University of Illinois Cooperative Extension Service, the Illinois Groundwater Consortium, as well as dissemination through related conferences and workshops. Progress in meeting short-term and long-term objectives has been excellent. The most complex task is coordinating research projects on flood issues involving multiple issues, such as biological, social, economic and political issues, where effective solutions await the expansion of research databases. Due to waterborne contaminant problems within the Mississippi River Basin and sub-basins, it is anticipated that the projects will continue beyond the year 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. From its beginning, the projects funded through the Illinois Groundwater Consortium involve reviews by at least three faculty/researchers drawn from 35 different universities, state, and federal labs and surveys, USDA's research laboratories, and other research centers. The reviewers rate proposals on criteria pertaining to scientific merit, quality of the research team, likelihood of the work resulting in publications and grant support from other sources, and relatedness of the project to the key objectives of the Illinois Groundwater Consortium. This peer review system enables the Consortium's Advisory Committee to select projects with high scientific merit from the group of proposals submitted for funding consideration. The titles, principal investigators' names and affiliations, and budgets are submitted to the USDA for review along with the Consortium's proposal for funding.

WATER QUALITY - NORTH DAKOTA

Mr. Skeen. Please provide a description of the research that has been funded under the water quality, North Dakota program grant.

Response. The original goal of this research was to develop an understanding of the occurrence, transport, and fate of agricultural chemicals found in representative field settings in the Northern Great Plains region of the United States. In 1996, the scope of the program was expanded to include additional water management issues in the Red River of the North drainage basin. The Red River Water Management Consortium, a partnership between public and private sectors, was established to address critical water quality and quantity issues in an area where agriculture is the predominant industry. A major objective of the Red River Water Management Consortium is to use results from the initial phases of this research program to find economical, practical, and timely technological solutions to water problems of the region. By providing cofunding for the program, Red River Water Management Consortium members become active stakeholders in the research and ensure the practicality of the work performed.

The focus of current work is on: 1) the assessment, development, and implementation of new technologies for addressing water quality and quantity concerns within the basin; 2) water resource assessment and analysis, including the development of mechanisms for providing easy access to water-related information so proper water management decisions can be made; 3) the determination of agricultural, industrial, municipal, and recreational impacts on water resources, both current and potential, and the identification of potential solutions to water quality and quantity problems and needs; 4) water quality monitoring and coordination of monitoring activities; 5) education and information dissemination on water issues facing this region of the United States; and 6) the development of a watershed management strategy for the Red River of the North Basin focusing on water quality and quantity to ensure continued economic development of the area.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. The original focus of the work was on agricultural chemicals in groundwater which potentially presents both a public health and an environmental quality problem of significant short- and long-term importance. The goal of this work was to provide a scientifically valid basis upon which meaningful agricultural chemical management and regulatory decisions could be made. The establishment of the Red River Water Management Consortium provided a mechanism for transferring results of the initial research to vested stakeholders of the region and for addressing water quality and quantity issues resulting from agricultural practices and development. The overall goal of the Red River Water Management Consortium is the development of a long-term watershed management strategy focusing on water quality and quantity which can be used as a model for watershed management in other agricultural regions in the United States.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original goal of the research program was to understand the occurrence, transport, and fate of agricultural chemicals in representative field settings in the northern Great Plains region so scientifically-valid decisions could be made for their management and regulation. Work on five of the seven sites originally instrumented under this program has been completed. Research at the two remaining sites is directed toward answering questions that have arisen during the course of this research program, specifically to determine the long-term trends in nitrate concentrations in surficial aquifers under irrigated agriculture and to determine the source and trends for sulfate.

Results from this program have been reported in journals, conference proceedings, and through presentations at national, state, and local meetings. To date, more than 40 presentations or publications have resulted. In addition, two doctoral dissertations and one master's thesis have resulted from this program.

Finally, the researchers have established the Red River Water Management Consortium as a mechanism for transferring the results of the initial research to vested stakeholders in the region and to the general public in order to address water quality and quantity problems resulting from agricultural practices and agricultural development.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. In 1989, $1.0 million was appropriated under the groundwater research program. Beginning in 1990, funds have been earmarked under the Direct Federal Administration program. Work supported by this grant was initiated in fiscal year 1990 with an appropriation of $987,000. Subsequent appropriations have been $750,000 in fiscal year 1991, $500,000 per year in fiscal years 1992-1993; $470,000 in 1994; $407,000 in fiscal year 1995; $436,000 in fiscal years 1996-1998; and $340,000 in fiscal year 2000. A total of $6,602,000 has been appropriated for this water quality research program.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Red River Water Management Consortium members provide co-funding to support their participation in the program. Cofunding provided by Red River Water Management Consortium members for fiscal year 1996 totaled $59,700 and for fiscal year 1997 totaled $80,000. Interest in this program continues to grow, and it was expected that at least $100,000 in cost-share would be obtained during fiscal year 1998 through membership fees. These funds are provided directly to the program and do not include in-kind costs incurred by the participants which are estimated to be several hundred thousand dollars.

Field activities to determine the long-term trends of nitrate and sulfate and to determine the source of sulfate are being conducted in cooperation with the North Dakota State Water Commission, which is providing an estimated cash equivalent funding in the amount of $33,660 for sample analysis and approximately $12,000 for field instrumentation. Instrumentation of sites occurred in fiscal year 1997, and sampling and analysis continued through fiscal year 1999.

Consortium members' dues are also used to provide in-kind services for match in other projects being performed by the Red River Water Management Consortium. A major project sponsored by the U.S. Environmental Protection Agency and local contributors to restore riparian areas in the Red River of the North Basin has been funded and will provide $175,000 for consortium activities over the next 4 years. The amount of in-kind services provided from Consortium member fees is $9,000 per year.

The U.S. Corps of Engineers has contracted through the Red River Water Management Consortium a $100,000 6-month effort to improve the decision making capability regarding ongoing flooding within the Devils Lake Basin, a sub-basin of the Red River of the North Basin. This work is intended to produce decision support tools, forecasts, data, and forums that can be continued to be used by the Corps St. Paul district, the states of North Dakota and Minnesota, the International Joint Commission, and the people of the Devils Lake region after the project has been completed.

Mr. Skeen. Where is this work being carried out?

Response. Research is being conducted at the University of North Dakota through its Energy and Environmental Research Center and at field sites and agricultural product-processing facilities in North Dakota, Minnesota, and Montana. In addition, a portion of the pesticide research was conducted at North Dakota State University. Cooperative efforts have resulted in work also being performed at cooperative institution locations such as the University of Waterloo, Victoria University, University of Montana, the Red River Resource Conservation and Development Council offices, and the North Dakota State Water Commission.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives of the project, specifically the field-related research, was fall 1995. This research has been completed; and the sites have been decommissioned, with the exception of those relating to long-term nitrate and sulfate monitoring and analysis. Work on nitrate and sulfate trends and occurrence was scheduled for completion in 1999. The Red River Water Management Consortium was established in 1996 as a mechanism for transferring the information derived from this research program to the technical community and to the public for use in

addressing water quality and quantity issues relating to agriculture and agricultural development. It is anticipated that Red River Water Management Consortium activities will continue for several years in order to meet the objectives as defined by the non-federal sponsors and the agency.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last agency evaluation of this project was conducted in September 1996. CSREES' Technical Project Officer attended a meeting of the Red River Water Management Consortium to evaluate and determine the status of this effort, which is currently the focus of research program activities. Progress was made by the Consortium during its first year, and the program is an excellent example of how federal and state agencies, research and academic institutions, private industry, and the general public can work together to solve problems in an economical manner to benefit people, communities, and the Nation. All project objectives were met for the first-year Consortium activities.

EXTENSION FEDERAL ADMINISTRATION PROJECTS

AGRICULTURE IN THE CLASSROOM

Mr. Skeen. Please provide a description of the research that has been funded under the Ag in the Classroom grant.

Response. Agriculture in the Classroom is an academic program designed to promote agricultural literacy among kindergarten through 12th grade ---K-12--- students. Funds appropriated for this program are used to leverage agricultural literacy activities in all fifty States, the District of Columbia, and U.S. territories by providing national leadership and guidance to State Agriculture in the Classroom Coordinators. This serves the educational needs of more than five million students through a network of more than 120,000 teachers annually. Activities during the past year include implementation of cooperative agreements to identify sound instructional materials that focus on the contribution of minorities to the food and agricultural system, establishment of a web site to provide faster and more cost-effective dissemination of information and materials, and planning and conducting an annual national conference.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. This outreach program is directed toward the youth of America. In the Federal Agriculture Improvement and Reform Act of 1996 Congress noted the importance of increasing the number of young Americans pursuing baccalaureate or higher degrees in the food and agricultural sciences. Agricultural literacy is a first step in creating interest and awareness of career opportunities in the food and agricultural sciences. Education studies cite that students learn best by example. Agriculture provides an excellent vehicle for providing hands-on learning experiences in a variety of academic disciplines including biological science, social science, language arts, and mathematics.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The original purpose of this outreach program was to promote agricultural literacy through the education system. The Secretary of Agriculture established the Agriculture in the Classroom Program in 1981 to help future generations become more agriculturally literate. Agriculture in the Classroom helps students understand the complexity of the total food and fiber system, appreciate its impact on the economy and society, and become citizens who support wise agricultural policies. The program encourages educators to integrate the critical role of agriculture in our economy and society into their teaching. The program provides leadership, counsel and education materials, and maintains a nationwide network of teachers, farmers, agribusinesses, and government officials who actively support the Agriculture in the Classroom mission. Cooperation between the Federal government and the agricultural community is strengthened through a Memorandum of Understanding between the National Agriculture in the Classroom Consortium and USDA.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal years to date.

Response. A total of $2,461,880 has been appropriated for this program as follows: fiscal year 1986, $76,000; fiscal years 1987 and 1988, $74,000 per year; fiscal year 1989 $87,000; fiscal year 1990, $135,000; fiscal year 1991,

$170,000; fiscal years 1992 and 1993, $208,000 per year; fiscal year 1994, $185,000; fiscal year 1995, $208,000; fiscal year 1996, $204,880; and fiscal years 1997 through 2000, $208,000 per year.

Mr. Skeen. What is the source and amount of non-Federal funds provided by fiscal year?

Response. This is not a grants program and does not require matching funds. Agriculture in the Classroom is highly leveraged through a variety of public and private funding that supports the State programs. The cooperative agreements that are in place have matching funds.

Mr. Skeen. Where is the work being carried out?

Response. National leadership for the Agriculture in the Classroom is provided by the Higher Education Programs unit within the CSREES. Each State actually manages its own program. Overall, the national program impacts an estimated 120,000 teachers and over 5 million students annually in grades K-12.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related activities?

Response. Beginning in 1981, under the direction of the Secretary of Agriculture, an Agriculture in the Classroom program was initiated in every State, the District of Columbia, and in the U.S. territories. Each State has a viable program. The goal of promoting agricultural literacy among America's youth is a continuing effort to serve each new generation of students.

In the past year, cooperative agreements have been implemented for the development of a high quality web site to coordinate and exchange ideas among each of the Agriculture in the Classroom State Coordinators, to sponsor national teaching awards, and further disseminate superior agricultural educational materials.

Agriculture in the Classroom annually sponsors a National Agriculture in the Classroom Conference to bring the Agriculture in the Classroom community together to expand experiences, ideas, materials, information, and techniques among State programs, educators, governmental agencies, agribusinesses and agricultural organizations. A quarterly newsletter communicates agricultural educational topics. A Resource Guide and outreach to educational associations are planned to enhance the Agriculture in the Classroom efforts.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The State Agriculture in the Classroom program coordinators have formed a National Agriculture in the Classroom Consortium. This provides USDA with another source of stakeholder input for identifying and setting priorities. Evaluations have been conducted in several States. Findings are provided to the Executive Committee of the National Agriculture in the Classroom Consortium and to the National Program Leader.

During each national conference formal evaluations are conducted. These are considered in defining future goals for the program. Participants find the conferences valuable for sharing ideas on projects and for obtaining resource materials. In response to evaluations a "teacher friendly" web site

has been developed and efforts are underway to find, develop and disseminate new educational materials.

BEEF IMPROVEMENT - ARKANSAS

Mr. Skeen. Please provide a description of the program that has been funded as the Arkansas Beef Improvement Program.

Response. The Arkansas Beef Improvement Program uses result demonstrations to demonstrate cost effective beef management practices. These demonstrations are conducted on family owned beef cattle operations. The type of demonstrations implemented on the farms is determined by the specific problems and needs of the rancher. Education gained is then transferred to other producers through beef cattle field days and presentations, 6-hour county workshops, factsheets and popular press articles.

Mr. Skeen. What is the national, regional or local need for this program?

Response. When planning, implementing and monitoring demonstrations, a business plan is used with specific goals and objectives. Therefore, the overall educational goal is to teach that decision making process rather than the specific management practices. Management problems differ from farm to farm, region to region and from year to year. Therefore, emphasizing problem identification and evaluation, exploring management options and monitoring progress are procedures that can be used throughout the ranching industry.

Mr. Skeen. What was the original goal of this program and what has been accomplished to date?

Response. The overall goal of the Arkansas Beef Improvement Program was to enhance the efficiency and profitability of the Arkansas beef cattle producer. This program uses demonstration farms to implement and evaluate management practices. There are four farms enrolled in whole farm demonstrations. These demonstrations are five-year commitments. Three farms are in year three of the program and one farm is in year one. There are eight special projects that address specific management problems. Depending upon the special project, they can last two to five years. Twenty farms either have been or are currently enrolled in special projects. A six-hour workshop was developed to teach other producers the decision making process used and practices implemented on demonstration farms. Twenty-six workshops in 21 countries have been conducted. A quarterly Arkansas Beef Improvement Newsletter, two Extension publications and monthly articles in the Arkansas Cattle Business publication are methods used to transfer information to the public.

Mr. Skeen. How long has the program been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. $200,000 has been devoted to this project from fiscal years 1993 through 1995 and in fiscal years 1996 through 2000, $197,000 was appropriated for a total of $1,585,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Arkansas provided $118,154 for this past year.

Mr. Skeen. Where is the work being carried out?

Response. The four current whole farm demonstrations and eight special projects are located on beef producing farms located throughout the state of Arkansas. These farms are family owned and operated and vary in size and stocking rates.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The Arkansas Beef Improvement Program currently has four whole farm demonstrations and twenty special projects. Three of the whole farm projects will finish in 2001, and the fourth whole farm project will finish in 2003. The special projects include cowherd performance, pasture renovation, establishing a breeding and calving season, stocker cattle, hay quality and supplemental feeding, replacement heifer management, cull cow management, and stockpiled forages. These projects range from two to five years in length. As farms complete special projects; additional farms are selected for special projects. The management problems addressed in special projects changes depending upon the need at the time.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A CSREES review of this project is conducted annually. The 1999 review was positive, with mention made of the efforts to develop decision making skills among beef producers. A suggestion was made to expand the environmental protection aspects of the project.

BOTANIC GARDEN INITIATIVE, ILLINOIS

Mr. Skeen. Please provide a description of the research that has been funded under the Botanic Garden Initiative, Illinois.

Response. CSREES has requested the university to submit a grant proposal that has not yet been received. The program is expected to increase student interest and understanding of science and other related subjects using gardening as the focus.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research?

Response. We have contacted the Chicago Botanic Garden regarding this special grant. Their anticipated research is expected to result in educational curricula, lesson plans, garden design and construction recommendations, and garden activities that will serve as a model for other cities throughout the U.S.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The anticipated goal of this research is to develop an innovative program that increases green spaces at Chicago's public schools and teaches elementary school students the value of plant science, math, nutrition, business, and literature. Students and teachers, in collaboration with the Garden, build and maintain gardens by using the Life Lab curriculum, a nationally acclaimed and widely used science curriculum.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant begins in fiscal year 2000 and the appropriation for fiscal year 2000 is $106,263.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds sources provided for this grant have not been determined at this time, since the grant has not yet been received.

Mr. Skeen. Where is this work being carried out?

Response. This work will be conducted at the Chicago Botanical Garden.

Mr. Skeen. What was the anticipated completion date for the original objective of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. Current progress indicates the anticipated completion date for the original objectives is five years.

Mr. Skeen. When was the last agency evaluation of this project? Provided summary of the last evaluation conducted.

Response. This is a new project which will begin in 2000; therefore no evaluation has occurred.

CONSERVATION TECHNOLOGY TRANSFER, WISCONSIN

Mr. Skeen. Please provide a description of the extension project that has been funded under the Conservation Technology Transfer, Wisconsin grant.

Response. This is a new project that will leverage funding at the University of Wisconsin with other federal, state and local sources to provide education and technical support to livestock producers regarding animal waste.

Mr. Skeen. According to the proposal, what is the national, regional or local need for this project?

Response. The need for this project is to meet new federal regulations on animal waste to protect public waters and air quality. It can also serve as a regional model for the dairy industry.

Mr. Skeen. What was the original goal of this project and what has been accomplished to date?

Response. The original goal of this project is to coordinate nutrient management assistance for livestock producers among multiple agencies and the private sector. It is a new project that has not yet received funding.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant will begin in fiscal year 2000, and the appropriation for fiscal year 2000 is $170,022

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The non-federal funds and sources provided for this grant are expected to be $600,000 from state and local funds for fiscal year 2000. As a new grant, commitments are still being secured.

Mr. Skeen. Where is this work being carried out?

Response. This project will be conducted with individual producers throughout Wisconsin, in coordination with the USDA Agricultural Research Station in Madison.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date for the original objectives is one year from the date of fund transfer. As a new project, no funds have been received to date.

Mr. Skeen. When was the last agency evaluation of this project?

Response. This new project will have an evaluation process included in the proposal.

DELTA TEACHERS ACADEMY

Mr. Skeen. Please provide a description of the program that has been funded under the Delta Teachers Academy project.

Response. The National Academy proposes to continue its Delta Teachers Academy in the Lower Mississippi Delta Region --- 219 counties and parishes near the Mississippi River including portions of Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri and Tennessee --- focusing on educational improvement in core subject areas. The program was launched in 1992 with a pilot grant of $500,000 from the U.S. Department of Education. U.S. Department of Agriculture funding began in 1994. The program provides long-term academic enrichment to approximately 525 elementary and secondary school teachers at 35 sites by teaming them with university scholars for in-service training during the school year and with summer institutes. Through its Fellows Program, the Delta Teachers Academy sustains the professional development of more than 650 Academy graduates throughout the region. This grant is not awarded competitively; however, we require annual applications reporting the previous year's accomplishments and describing planned activities and expenditures for the coming year. These applications undergo merit review before the awards are made.

Mr. Skeen. What is the national, regional, or local need for this project?

Response. The 219-county Lower Mississippi Delta region has been cited by the Educational Testing Service and the National Center for Education Statistics as notably lagging in student performance in core academic areas. According to the grant recipient, 33 percent of the children in the region live below the poverty line compared to 20.5 percent nationally. In 1996, 60 percent of Louisiana's public school sample ranked "below basic" on the National Assessment of Education Progress test for eighth-graders. The USDA's Economic Research Service correlated poor educational performance, rural poverty, and limited economic development. The Delta Development Commission cited serious educational problems including poor student performance in core content areas, demoralized teachers with little opportunity for academic

development, and region-wide difficulty in recruiting and retaining qualified teachers. The Commission noted that 75 percent of the region's workforce lacks the basic reading skills necessary for technical training, and specifically cited improved teacher training as one means for breaking the cycle of poverty and economic noncompetitiveness.

Mr. Skeen. What was the original goal of the program and what has been accomplished to date?

Response. The original and continuing goal of the project is to address the problem of insufficient professional development opportunities for the elementary and secondary teachers of the seven-state region. The Delta Teachers Academy focuses on core subjects of English, geography, history, mathematics and science. Some sites also focus on humanities, language arts, social studies, reading, civics and interdisciplinary subjects. The Delta Teachers Academy began by offering educational development activities for 100 teachers from 50 rural districts at 10 sites. Training has expanded to 600 teachers at 35 sites across the entire seven-state region. More than 750 graduates whose professional development is sustained through the Academy's Fellows Program lead teacher in-service training at their home schools. The project has improved student performance and teacher training, morale, recruitment and retention in the region.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. A total of $24.161 million has been appropriated to the Department of Agriculture for this project, including $2 million in fiscal year 1994; $3.935 million in fiscal year 1995; $3.876 million in fiscal year 1996; $3.850 million in fiscal year 1997; and $3.500 million each year in fiscal years 1998 through 2000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. There are no non-federal funds identified for this project.

Mr. Skeen. Where is the work being carried out?

Response. The Delta Teachers Academy project is coordinated out of The National Faculty's Southern Region office in New Orleans, Louisiana. The project is conducted at 33 sites in the seven-state Lower Mississippi Delta region including Arkansas, Kentucky, Illinois, Louisiana, Mississippi, Missouri, and Tennessee.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original objective was to provide three full years of training to each faculty team established by the Delta Teachers Academy. Training consists of four two-day academic sessions and one two-week summer institute for each team. This objective was met for the 24 faculty teams funded under a fiscal year 1994 Department of Agriculture grant; for 15 additional teams funded in 1995; and for one team funded in fiscal year 1996. The 20 teams funded in fiscal year 1997 have received two years of training and the 14 teams funded in fiscal year 1998 have received one year of training.

Objectives for fiscal year 1999 included providing ongoing professional development of 35 teams consisting of 600 participants; adding two additional teams to maintain the level of service to 35 teams throughout the region; instituting new procedures to better meet clientele needs based on an independent review completed by Westat; intensifying its individual and field-based approach; and drafting individual work plans for each site. The anticipated completion date is September 30, 2002.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. An assessment of the short-term impact of the Delta Teachers Academy by Westat, Inc. of Rockville, Maryland was completed in August 1997. Westat found the majority of participants reported that the Academy met their personal and professional needs by renewing their enthusiasm for teaching, improving self-confidence, increasing their sense of professionalism, improving their knowledge of specific content areas, enhancing teaching methods and interacting with peers. Teachers are applying what they have learned from the Academy in their classrooms. For example:

- 88 percent said the Academy prepared them to assume leadership roles in their schools;
- 89 percent noted changes in student work habits, attitudes, aspirations and achievements;
- 90 percent applied academic content from the program in their classrooms;
- 78 percent used skills and strategies learned at the Academy in their classroom teaching;
- 83 percent said their teaching approaches became more effective in improving student learning.

A U.S. General Accounting Office review of the Academy's programs was conducted in 1995. Report GAO/RCED-95-208 included summary statistics on more than 1,000 teacher evaluations of Academy sessions as well as the General Accounting Office's survey of participants. On average, participants reported that the Academy was more effective than any other teacher development program they had participated in, was very effective in renewing or enhancing knowledge in one or more academic subjects, and was generally effective in enhancing the teaching skills and strategies required for teaching challenging academic content.

A site visit of the Delta Teachers Academy in New Orleans, Louisiana and the National Faculty's Summer Institute at Tulane University was conducted by the CSREES's National Program Leader for Higher Education and Evaluation in 1996. The visit confirmed that Delta Teachers Academy strengthened participating teachers' abilities by improving their knowledge base, helped them become leaders of other teachers by requiring them to conduct staff development at their home schools, and had a positive impact on student learning. School superintendents reported greater student enthusiasm, more homework, and higher test scores for students whose teachers were participants in the Delta Teachers Academy program.

DIABETES DETECTION AND PREVENTION, WASHINGTON AND HAWAII

Mr. Skeen. Please provide a description of the extension activity that has been funded under the Diabetes Detection and Prevention, Washington and Hawaii, grant.

Response. The grant supports research/demonstration and outreach activities designed to (a) detect undiagnosed diabetes through use of a non-

invasive ocular fluorescence technique, and (b) promote collaborative efforts by CSREES and The Joslin Diabetes Center to develop and pilot test a model to provide diabetes screening, prevention education, and case management services for selected rural and urban populations in Hawaii and Washington.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional or local need for this research/demonstration program.

Response. This program grows out of a need to reach more of the millions of Americans who have undiagnosed diabetes. Diabetes is currently one of the leading causes of death and disability in the U.S. adult population, and is highest among certain racial and ethnic populations, especially Native Americans, African Americans, Hispanic Americans, and Asians and Pacific Islanders.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this research/demonstration and outreach project is to (1) provide screening for diabetes among selected rural minority patient populations in Washington and Hawaii using innovative detection technology and blood glucose measures; (2) diabetes education prevention and care materials; and (3) case management support and follow-up services for patient referrals.

Among the accomplishments to date are the following:

(a) CSREES has met with representatives of the Joslin Diabetes Centers, and convened regular telephone conferences with representatives of State Cooperative Extension Partners in Washington and Hawaii, and all partners.

(b) A Memorandum of Understanding has been prepared and approved by USDA and Joslin Diabetes Center.

(c) A revised proposal has been submitted by the Joslin Diabetes Center, and the Hawaii and Washington Extension Programs which clarifies the Project's objectives, and establishes roles and expectations of each of the partners.

(d) Prevention and care materials are in draft form and are being reviewed by Cooperative Extension staff.

(e) Cooperative Extension staff are being trained in delivery techniques for diabetes care and risk reductions strategies.

(f) Cooperative Extension staff are establishing local collaborations with health agencies, and developing recruitment and maintenance strategies.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in FY 1999 with an appropriation of $550,000; the FY 2000 appropriation is $550,000. The total appropriation is $1,100,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. There were no non-federal funds and sources provided for this grant.

Mr. Skeen. Where is this work being carried out?

Response. The research and demonstration will be conducted at Joslin Diabetes Centers at Swedish Hospital in Seattle, Washington, and Straub Hospital in Hawaii. In addition, the Cooperative Extension offices in selected counties in Hawaii and Washington will be involved in program implementation.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completed date for the original objectives is 2002. The anticipated completion date of the revised objectives is 2004.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The project did not get underway until late in FY 99 because of the need to prepare and seek approval of the Memorandum of Understanding. Thus, an Agency evaluation has not yet occurred. A mid-year evaluation of program outputs and the delivery process to date will occur in July 2000.

EXTENSION SPECIALIST, MISSISSIPPI

Mr. Skeen. Please provide a description of the program that has been funded as the Basic Weather Service for Research and Extension Project.

Response. The Basic Weather Service and Extension project is designed to fill a void in weather data due to closure of the Ag Weather Service facility in Stoneville, Mississippi. The funding will be used to gather and disseminate critical agricultural weather data for producers and researchers in Mississippi and surrounding states.

Mr. Skeen. What is the national, regional or local need for this program?

Response. The grant proposal states that the Ag Weather Service facility was closed at Stoneville, Mississippi. This action has created a void in the availability of and access to critical weather data that producers and researchers use to make management decisions and to formulate work plans within the state and region. The weather data collected by this project serves a national need to provide a national database.

Mr. Skeen. What was the original goal of this program and what has been accomplished to date?

Response. The goal of the project is to collect, maintain, and disseminate weather information for producers and researchers in Mississippi and surrounding states. Electronic weather stations and links with other web sites to deliver weather data have been installed and developed. The project is providing timely data to producers in the Delta.

Mr. Skeen. How long has the program been underway and how much has been appropriated by fiscal year through 2000?

Response. The funding for fiscal years 1997 and 1998 was $50,000 each year and for fiscal years 1999 and 2000, $100,000 each year. A total of $300,000 has been appropriated.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The State of Mississippi through the Mississippi Cooperative Extension Service and Delta Research and Extension Center provided $41,350 in state appropriated funds to support this project in 1997, 1998, and 1999.

Mr. Skeen. Where is the work being carried out?

Response. The project will be conducted at the Delta Research and Extension Center in Stoneville, Mississippi.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of the additional or related objectives?

Response. One of the original objectives, installation of equipment to collect weather data and establishment of a website, has been completed. The agriculture community--producers, markets, suppliers of goods and services, and financial institutions--depend upon weather information as a guide for business planning and decision making. The National Weather Service has eliminated certain critical services to rural areas and to agriculture clientele. As agriculture implements new programs in pest management, crop production, and site-specific farming, near real-time weather data is needed for the success of these programs. Weather services provided by the Stoneville project will be in cooperation with and complementary to services provided by the National Weather Service. Additional objectives relating to the collection, process, and disseminate of timely weather data are needed in the Delta Region. Current funding supports the objectives to ensure these weather services are available to the region.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Evaluation of the project and Internet website is being conducted with an on-line survey instrument and through e-mail responses about the site. An advisory group has been identified and is functioning to provide feedback on the weather center's current status as well as assessing needs for future plans for the project's continued mission.

INCOME ENHANCEMENT DEMONSTRATION, OHIO

Mr. Skeen. Please provide a description of the program that has been funded under the Income Enhancement Demonstration Project for Northwest Ohio.

Response. The Federal funds support the Agricultural Business Enhancement Center which plays a major role in the development of the agricultural sector of Northwest Ohio. The Center provides a variety of management training programs, helps farmers and other agribusinesses develop comprehensive business plans, and facilitates business networking. CSREES performs an annual merit review of this project.

Mr. Skeen. According to the research proposal, or principal researcher, what is the national, regional, or local need for this program?

Response. The Center seeks to enhance the competitiveness of agricultural firms in Northwest Ohio and create greater economic opportunity for local residents. To be successful in business, farmers and other agribusiness firms must be able to adapt to a large number of major changes affecting the entire

food system from the farmer to the consumer. These include changes in farm programs, globalization of markets, new technologies, information systems, consumers' concerns for food safety and nutrition, and society's concern for protecting the environment. Individuals, families, firms and communities in Northwest Ohio need to understand the changes, develop and implement effective strategies for dealing with change.

Mr. Skeen. What was the original goal of this program and what has been accomplished to date?

Response. The original goal of the project was to help people develop new businesses and restructure and expand existing businesses in order to enhance incomes in Northwest Ohio. The Agricultural Business Enhancement Center conducts economic research on market opportunities, provides a variety of management training programs, helps individual farms and other agribusinesses develop comprehensive business plans, and facilitates networking with businesses in other regions of the United States and around the world. Recent accomplishments include the following: A group of growers formed a cooperative and contracted with the Ohio Turnpike Commission to operate farmers markets at rest stops; farmers expanded their use of the national Internet Hay Exchange; sugar beet grower associations are exploring the feasibility of reopening a closed processing plant; Christmas tree growers worked together to expand their market and increase sales; at an annual Women in Agriculture forum, 61 percent said workshop participation would improve management of the family farm, 78 percent would improve family relations, and 28 percent would improve farm income; Master Gardener volunteers were trained and provided over 6,000 hours to advise local home gardeners.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The project began in 1991. Appropriations have been as follows: $145,000 in fiscal year 1991; $250,000 per year in fiscal years 1992 through 1995; and $246,000 per year in fiscal years 1996 through 2000. Appropriations to date total $2,375,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. The State of Ohio has appropriated the following funds: $35,100 in fiscal year 1991; $72,368 in 1992; $56,930 in 1993; $30,547 in 1994; $49,935 in 1995; $51,432 in 1996; $48,664 in 1997; $53,736 in 1998; and $56,186 in 1999.

Mr. Skeen. Where is the work being carried out?

Response. The Agricultural Business Enhancement Center is located in Bowling Green, Ohio and serves eight counties in the Toledo Metropolitan Area. Project leadership is being provided by the Department of Agricultural Economics, Ohio State University, Columbus, Ohio.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have these objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1991 was for a period of 12 months, however, the ongoing needs of producers and agribusinesses to adjust to major changes in the agricultural sector continues to provide the Center with many challenges. The current phase of the program will be completed in 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. CSREES performed a merit review of the project in February 1999. In that review it was noted that: "The FY99 proposal is especially well done – for each of its 3 objectives, there are one or more goals, and each goal has procedures and evaluation plans." Throughout the year, the project director completed evaluations which clearly demonstrated the value of the project to citizens of Ohio.

INTEGRATED COW-CALF MANAGEMENT - IOWA

Mr. Skeen. Please provide a description of the program that has been funded as CHIPS: Cow-Calf Integrated Resource Management Program.

Response. CHIPS is an integrated cow-calf resource management program that originally targeted an eleven county area in southeast Iowa. The intent of the program is to impact the area's economy by maximizing the profit potential of individual livestock operations. Program technicians work one-on-one with participating beef operations, utilizing a variety of management services designed to assist these producers as enterprise decisions are made. The program has grown to extend services to over 200 beef producers in over 60 Iowa counties.

Mr. Skeen. What is the national, regional or local need for this program?

Response. The agricultural economy of Iowa and surrounding states has suffered over the past several years due primarily to low commodity prices, especially corn, soybean, and hog enterprises. Selected areas of Iowa have also been challenged with extreme weather conditions that have impacted many beef operation current and long-term financial and managerial decisions.

To address this rapidly changing agricultural infrastructure, the program has adjusted its direction and focus to meet the management and technical needs of Iowa beef producers. Program technicians and staff work closely with participants to collect and analyze individual operation data. This information is necessary as management recommendations are developed to enhance the performance and economic stability of the operation. This approach supports individual economic survival as well as strengthening the local and regional economic community.

The Iowa cattle industry is exploring strengthening its position by building a new beef harvesting facility. This involves cooperation of many industry representatives. If this effort becomes a reality, the importance and need for such programs will continue to grow and expand. Producers will need continued technical assistance and expanded services as long-term decisions are made to supply a high quality, source verified, environmentally sound product to consumers.

Mr. Skeen. What was the original goal of this program and what has been accomplished to date?

Response. The overall goal of the program is to have a positive effect on the area's economy by improving the long-term profit potential of the local cattle industry. Objectives include improving the understanding of producers about cow-calf production on highly erosive land, providing intensive technical assistance to develop goals and individualized farm recommendations

and helping producers develop management skills to improve efficiency and lower costs of production. Over 220 cow-calf operations are to be involved in 2000.

Over the past several years, the program has expanded in geographical area, clientele and technicians. The program has grown from one technician and 11 counties in 1992 to seven technicians providing services to over 60 counties in Iowa. These technicians serve over 220 cooperators that manage over 18,000 beef cows.

During the 1998-99 fiscal years, technicians conducted over 1,330 farm and office visits. Numerous management areas were addressed during these one-on-one contacts. Over 27,000 head of calves and beef cows were weighed and over 4,000 breeding animals were permanently identified. A total of 33 performance analysis records incorporating financial and performance information were individually analyzed. More than 560 forage and soil samples were collected and approximately 300 ration projections were developed for cooperators.

Networking projects are emphasized by the program. Examples include the heifer development program, regional steer tests, educational efforts in conjunction with the Iowa Beef Center, Iowa State University Extension and the Iowa Quality Beef Program.

Mr. Skeen. How long has the program been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. $138,000 was approved for fiscal year 1992; $138,000 for fiscal year 1993; $276,000 for fiscal year 1994; $350,000 for fiscal year 1995; $345,000 for fiscal year 1996; $345,000 for fiscal year 1997; $300,000 per year in fiscal years 1998 and 1999; and $250,000 in fiscal year 2000. Federal funding through fiscal year 2000 totals $2,442,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Cooperators pay fees of approximately $3.00 per beef cow on a sliding scale that adjusts for herd size. In FY 1999, approximately $47,000 in fees were collected.

Mr. Skeen. Where is the work being carried out?

Response. The program is operated in six designated technician areas in Iowa. Services and technical support are offered to producers in approximately 60 Iowa counties.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The objectives and goals of the program have been modified to meet the needs of cooperators and adjust to the rapidly changing cattle industry. The program initially projected to address the objectives in a three-year time frame. However, due to the expansion of the program in both geographical area and cooperator numbers, services and technical assistance have been modified to accommodate the numerous changes experienced by the industry.

Over the past several years, the program has made considerable progress in achieving its goals. Cooperators are utilizing more of the data collection

and record keeping programs that are offered. This data collection process has been important as producers make long-term decisions.
The Iowa beef industry faces a challenging and exciting time. With the beef harvest facility initiative underway, the support and assistance offered to producers needs to be modified and adapted. A three-year time frame for the development and initiation of the Iowa Beef Network is expected.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The last annual review of this project was conducted by the agency in May, 1999. This review was positive, with special note taken of the expansion of the project to include a greater number of beef producers, promotion of a sound business approach to on-farm record keeping and management practices, and the efforts to extend this knowledge to other beef producers of the State.

NATIONAL EDUCATION CENTER FOR AGRICULTURAL SAFETY, IOWA

Mr. Skeen. Please provide a description of the extension project that has been funded under the National Education Center for Agricultural Safety grant.

Response. The mission of the National Education Center for Agricultural Safety is to reduce the level of preventable illnesses, injuries and fatalities among agricultural populations. The National Education Center for Agricultural Safety serves farmers, ranchers, their families and employees by providing hands-on training and education programs at the Center. The center works in conjunction with the "Farmedic" program and teaches agricultural families how to handle farm emergencies by providing First on the Scene and First Responder courses. It also provides training for rural firefighters and paramedics who respond to rural emergencies.

The National Education Center for Agricultural Safety is located in Peosta, Iowa on the Northeast Iowa Community College Campus. Phase Two of the center's construction program has just been completed, allowing the center to provide training in "real life situations". Experience in handling grain bin entrapments, farm equipment entanglements, manure pit rescues, tractor overturns, livestock, and utility emergencies are provided. Regularly scheduled training includes general First Aid and Cardiopulmonary Resuscitation courses.

The center has assisted local farmers and small corporations to screen workers for employment health risks and conducts health education programs on hearing conservation, skin cancer prevention and prevention of swine confinement worker and animal health problems.

The center operates an 11,000 square foot facility that was funded by the state of Iowa with matching private donations. The USDA grant provides salaries and operating funds, corporate and private donations provide needed programs and equipment. The National Safety Council and Northeast Iowa Community College underwrite additional operational costs not covered in the USDA grant or donations.

Mr. Skeen. According to the extension proposal, or the project director, what is the national, regional and local need?

Response. The project director believes this training to be of national, regional, and local need. According to information compiled by the National Safety Council, 800 farmers and ranchers died in farm work incidents in 1998. Nearly 50 percent of these fatalities were related to work with farm tractors

and equipment. Many of the training programs conducted at this new training center are focused on issues related to safe machinery operations. Included are safe tractor operation programs for youth and young adults and safety equipment retrofitting of farm equipment in cooperation with farm machinery manufacturers.

One common thread for most fatal injury incidents in U.S. agriculture is that they are preventable. To prevent these serious injuries and deaths, the National Education Center for Agricultural Safety develops interactive training for the many at-risk audiences, including senior farmers, children and youth, and farmers who work part-time off the farm. These programs are offered in many local, regional, and national settings and are aimed at increasing awareness and knowledge about the hazards that impact farmers, ranchers, their families, and their employees.

Mr. Skeen. What was the original goal of this training center and what has been accomplished to date?

Response. The original and continuing goal of this project is to develop, implement and evaluate diverse training methods for meeting the desired training objectives of at-risk agricultural audiences. For example, the training center has developed and is currently testing the feasibility of delivering agricultural safety and health information over fiber optic systems in the Midwest. This training is designed for firefighters and emergency medical service providers who respond to farm chemical emergencies. By using a fiber optics delivery technology, the training center is able to reach over 20,000 volunteer firefighters and rescue personnel with the latest methods for mitigating farm chemical and fertilizer fire, explosion and spill and leak emergencies.

The training center's 12 acre site is also now equipped with confined spaces facility for delivering important hands-on training on manure storage hazards and silo gas risks for U.S. dairy farmers. This $60,000 private donation enables the center's staff to present real-life scenarios about the risks associated with naturally-occurring gases in production agriculture.

It should also be noted that many of the center's programs are developed for safety professionals who work with farmers and ranchers across the nation. These programs are designed for train the trainer initiatives that greatly expand the education and training opportunities for farm populations that would otherwise be at risk due to the unavailability of effective training.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. The work supported by this grant began in fiscal year 1998 with an allocation of $195,000, and has remained at this level through fiscal year 2000. The total appropriation to date has been $585,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Non-federal funds and sources of donations were as follows: In 1998, non-federal funds included $450,000 state appropriation dedicated to the construction of Phase II; and $75,000 of miscellaneous donations and in-kind contributions received from Deere & Company, Dupont Corporation, Double L Group, Ltd, Melroe Company, Dubuque Racing Association and Theisen's Farm,

Home and Auto, Inc. In 1999, non-federal funds totaled $135,200 from the same sources as 1998 and additional state, non-profit organizations and private sources.

Mr. Skeen. Where is this work being carried out?

Response. Training and educational initiatives under this grant are being conducted at the National Education Center for Agricultural Safety, located on the campus of Northeast Iowa Community College in Peosta, Iowa.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The anticipated completion date of the original objectives is approximately March 31, 2000. Many of these objectives have already been met. Anticipated completion date of additional objectives is March 31, 2001.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. A CSREES merit review of the project application and site review were conducted in the spring of 1999. Another site visit is scheduled for June 2000. The project will be completing its second fiscal year on March 31, 2000. The National Education Center for Agricultural Safety utilizes external farm safety and health evaluators and two advisory committees to maintain its focus on the most pressing issues affecting the safety and health of our nation's agricultural populations.

Wisconsin-Stout's Northwest Wisconsin Manufacturing Outreach Center with direct consultation and long-term in-plant assistance delivered primarily through the efforts of university Project Managers. Direct assistance may be delivered through Co-op students, staff of the University of Wisconsin System, both two-and-four year institutions, and Extension services; the Wisconsin Technical College System; secondary schools; the private sector, professional societies, and private consultants, or attendance at state or national seminars. The project also draws on many other state resources to add expertise and capacity to network facilitation and in-plant extension activities. The project has undergone a merit review.

Mr. Skeen. What is the national, regional, or local need for this program?

Response. America's manufacturers continue to face tremendous global competition. There are enormous pressures to improve the quality of products; reduce the time consumed to bring new products to market; and there remains an ever increasing demand to reduce the costs of products. Currently there is a strong movement in manufacturing to use speed-to-market combined with new product introduction as a tool to obtain a competitive advantage. While high quality and cost efficiencies continue to be mandatory commitments for today's manufacturers, great value is now being placed on speed-to-market. Large companies are not the only ones influenced by these trends. Small and medium size manufacturers often supply directly to the market or are vital elements of a supply chain. Hence, they must be able to respond quickly to changing market conditions while continuously improving productivity and product quality.

Mr. Skeen. What is the original goal of this program and what has been accomplished to date?

Response. The Manufacturing Technology Transfer program's principal objective is the development of a competitive, secure manufacturing base through the mechanism of industrial extension. The program principally targets small and medium size manufacturers in rural Wisconsin. This funding will: continue to provide valuable industrial extension service to the target audience; support the continued empirical development of an industrial extension model; and investigate the use of new manufacturing technologies to support global competitiveness of manufacturers. Productivity improvements were reported by the companies showing impressive economic impact to the region through client operations assessments and plant evaluations, strategy development for continuous improvement, implementation of new organizational and operational methods, implementation of new manufacturing technologies, establishment of quality assurance/total quality systems, establishment of ongoing training programs, on-site instruction in new technologies, improved methods, and processes.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This project has been underway since FY 1992 and was funded for $165,000 per year in FY's 1992 through 1995, and for $163,000 in FY's 1996 through 2000 for a total of $1,475,000.

Mr. Skeen. What is the source of and amount of non-federal funds provided by fiscal year?

Response. University of Wisconsin-Stout provides $24,367 as in kind match. Funds from other state, University, and partner resources are pooled with USDA funds to carry out the described efforts.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1992 was for a period of 12 months. However, the Manufacturing Technology Transfer Program was developed as a continuously evolving industrial extension strategy for serving the needs of the manufacturing community. The Manufacturing Technology Transfer program is measured by success in meeting the objectives of the past five years' proposals, including the delivery of modernization assistance and development of an industrial extension model. The current phase of the program will be completed in 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. To measure the success of the project, a client evaluation process has been developed which includes an evaluation questionnaire. Evaluations are performed both by program staff, and by an objective, third-party survey house. Evaluations indicate significant forward strides in job creation, new businesses, expanded productivity, and enhanced international competitiveness. An agency evaluation of this project was last performed by the Department of Commerce in 1999.

PILOT TECHNOLOGY TRANSFER PROJECTS, OKLAHOMA AND MISSISSIPPI

Mr. Skeen. Please provide a description of the program that has been funded under the Oklahoma and Mississippi Technology Transfer Projects.

Response. The original work involved the transfer of uncommercialized technologies from Federal laboratories and universities to rural businesses and communities. The objectives have evolved to providing more one-on-one assistance to small manufacturers. This type of assistance responds to the stated needs of the small manufacturing community and fills a recognized gap in the existing service provider community. This innovative and unique program has opened an entirely new clientele base for Cooperative Extension, small rural manufacturers in Oklahoma. This project has undergone a merit review.

The original project in Mississippi focused upon the exploration, evaluation, development, and education/transfer of innovative technologies throughout the state such as agribusinesses, rural businesses and industries, communities, and local governments. In Mississippi, these original goals are still the guiding principle of the project. Specific objectives and activities of the project have been modified as the project and new technologies have been invented and introduced.

Mr. Skeen. What is the national, regional, or local need for this program?

Response. Manufacturing extension programs throughout the country have identified one-on-one engineering technology assistance as a need for small manufacturers as they attempt to become more competitive and profitable. The Oklahoma Manufacturing Extension Partnership has received national acclaim for its noteworthy and highly effective partnership with the Land Grant University. This partnership was forged in 1995 by the Technology Transfer Program and continues today as the model Applications Engineering Program. As the Applications Engineering Program has begun to address more of the manufacturing engineering issues on a state-wide basis, the Technology Transfer Program has been exploring new ways of providing technology assistance to the small manufacturers. The Technology Transfer Program will begin augmenting its manufacturing engineering and technology service with Advanced Manufacturing Management Systems assistance to include: Resource Planning and Control, Manufacturing Operations Costs Analysis and Control, Manufacturing Process Simulation, and Electronic Commerce.

Mr. Skeen. What is the original goal of this program and what has been accomplished to date?

Response. The primary goal of these programs is to contribute to an increase in business productivity, employment opportunities, and per capita income by utilizing technology and information from Federal laboratories, Rural Enterprises of Oklahoma, Inc. of Durant, Oklahoma; Mississippi State Food and Fiber Center; Vocational-Technical Education System; Center for Local Government Technology; Cooperative Extension Service; and other university departments and non-campus agencies.

The original project in Mississippi focused upon the exploration, evaluation, development, and education/transfer of innovative technologies to various throughout the state such as agribusinesses, rural businesses and industries, communities, and local governments. In Mississippi, these original goals are still the guiding principle of the project. Specific objectives and activities of the project have been modified as the project and new technologies have been invented and introduced.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Funding appropriated to date is as follows: $350,000 per year in fiscal years 1984 and 1985; $335,000 in fiscal year 1986; $333,000 per year in fiscal years 1987 through 1990; $331,000 per year in fiscal years 1991 through 1995; and $326,000 per year in fiscal years 1996 through 2000. Total appropriations is $5,652,000.

Mr. Skeen. What is the source and amount of non-federal funds?

Response. Oklahoma State University and Mississippi State University have provided considerable amounts of matching support from state funds over the life of the project. Over the past four years, support has included a significant portion of engineering faculty salaries as well as the administrative support of county and district extension staff.

Mississippi State University has provided a considerable amount of matching support from state funds each year of the project. Matching funds have been at least equal to the amount of the Federal funds provided for the project in the past 10 years. Matching funds have included faculty salaries, technology equipment, travel, commodities, and administrative support. Additional non-federal funds have been provided.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out at Mississippi State University and Oklahoma State University and, more importantly, on the shop floors of the small rural manufacturers. Work related to this project is being carried out at the University, in some of Mississippi's Community Colleges, on the Internet, and in every county in Mississippi. Demonstrations, educational workshops, Internet access, video-conferencing sessions, satellite conferences, and one-on-one sessions have been conducted in businesses, local government offices, Extension offices, schools, farms, and even homes where appropriate.

Mr. Skeen. What is the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1984 was for 12 months. The original objectives have been, and continue to be met. Although individual client projects have a beginning and end, the technology transfer process is continuous. Over the past years, specific and measurable annual objectives and the achievement of objectives have been documented in annual reports. The objectives of both programs have been to continue the delivery of high-quality engineering assistance and technology transfer services to small manufactures, conduct joint workshops, client referral, and joint research and application projects, and demonstrate a value of service to clients many times project operating costs.

In Mississippi the original project contained objectives designed to be completed in 12 months. However, the first year clearly demonstrated that fully reaching objectives related to the transfer of new technology not only takes longer to achieve, but becomes a never ending process as the challenge is constantly changing as new technologies are developed. The technology transfer process is an extended and a continuous process. Over the past years, specific annual objectives and activities have been set and achieved and have been documented in annual reports. The objectives and activities of the current project are designed to be completed in FY 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. Site visits and merit reviews have been conducted annually on these projects as well as client surveys by project staff themselves. Survey results have documented job creation, productivity enhancement, and local community economic activity. The Technology Transfer Program has impacted the integration of emerging technologies that are benefitting the citizens, ranging from assisting small businesses and industries in integrating new computer hardware and software for conducting electronic commerce, to providing extensive on-line information resources. The Technology Transfer Funds have served as a catalyst for the development of a long range telecommunications network plan for the total extension service to link all county extension offices and research centers directly to the Mississippi data/video backbone and provide access to the Internet.

Evaluation for the Technology Transfer Project in Mississippi has been both formative and summative. The effectiveness of all project activities is carefully reviewed and input is gathered from the individuals who participate in the training sessions to determine if the objectives of the project are being achieved. Evaluations of every educational workshop and activity are conducted on a regular basis and have consistently yielded outstanding marks. At the end of each year, a careful review of project demonstrations/ exhibits/presentations, as well as the number of individual served, are reviewed. Perhaps the best indicator of success has been the continued increase in the demand for these technology-related activities. Also, Mississippi State University Extension Service annually reviews its implementation of new technologies to insure that these technologies are being utilized in the most effective manner possible. This project has allowed the Mississippi State University Extension Service to make significant progress in educating the clientele it serves. No State Extension Service provides more technology transfer education than Mississippi for its personnel. This training equips our county personnel to be more effective technology transfer educators and advisors to outside clientele to the point where county personnel are now conducting their own technology transfer training sessions. For example, Newton County personnel have provided at least 10 workshops in the past year for county clientele.

PILOT TECHNOLOGY PROJECT WISCONSIN

Mr. Skeen. Please provide a description of the program that has been funded under the Wisconsin Pilot Technology Project.

Response. Primary industrial extension activity of the Manufacturing Technology Transfer program is the delivery of technical assistance to manufacturing companies. Executive direction in determining the assistance required will be provided by the University of Wisconsin-Stout's Northwest Wisconsin Manufacturing Outreach Center with direct consultation and long-term in-plant assistance delivered primarily through the efforts of university Project Managers. Direct assistance may be delivered through Co-op students, staff of the University of Wisconsin System, both two-and-four year institutions, and Cooperative Extension services; the Wisconsin Technical College System; secondary schools; the private sector, professional societies, and private consultants, or attendance at state or national seminars. The project also draws on many other state resources to add expertise and capacity to network facilitation and in-plant extension activities. The project has undergone a merit review.

Mr. Skeen. What is the national, regional, or local need for this program?

Response. America's manufacturers continue to face tremendous global competition. There are enormous pressures to improve the quality of products; reduce the time consumed to bring new products to market; and there remains an ever increasing demand to reduce the costs of products. Currently there is a strong movement in manufacturing to use speed-to-market combined with new product introduction as a tool to obtain a competitive advantage. While high quality and cost efficiencies continue to be mandatory commitments for today's manufacturers, great value is now being placed on speed-to-market. Large companies are not the only ones influenced by these trends. Small and medium size manufacturers often supply directly to the market or are vital elements of a supply chain. Hence, they must be able to respond quickly to changing market conditions while continuously improving productivity and product quality.

Mr. Skeen. What is the original goal of this program and what has been accomplished to date?

Response. The Manufacturing Technology Transfer program's principal objective is the development of a competitive, secure manufacturing base through the mechanism of industrial extension. The program principally targets small and medium size manufacturers in rural Wisconsin. This funding will: continue to provide valuable industrial extension service to the target audience; support the continued empirical development of an industrial extension model; and investigate the use of new manufacturing technologies to support global competitiveness of manufacturers. Productivity improvements were reported by the companies showing impressive economic impact to the region through client operations assessments and plant evaluations, strategy development for continuous improvement, implementation of new organizational and operational methods, implementation of new manufacturing technologies, establishment of quality assurance/total quality systems, establishment of ongoing training programs, on-site instruction in new technologies, improved methods, and processes.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This project has been underway since FY 1992 and was funded for $165,000 per year in FY's 1992 through 1995, and for $163,000 per year in fiscal years 1996 through 2000 for a total of $1,475,000.

Mr. Skeen. What is the source of and amount of non-federal funds provided by fiscal year?

Response. University of Wisconsin-Stout provides $24,367 as in kind match. Funds from other state, University, and partner resources are pooled with USDA funds to carry out the described efforts.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1992 was for a period of 12 months. However, the Manufacturing Technology Transfer Program was developed as a continuously evolving industrial extension strategy for serving the needs of the manufacturing community. The Manufacturing Technology Transfer program is measured by success in meeting the objectives of the past five years'

proposals, including the delivery of modernization assistance and development of an industrial extension model. The current phase of the program will be completed in 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. To measure the success of the project, a client evaluation process has been developed which includes an evaluation questionnaire. Evaluations are performed both by program staff, and by an objective, third-party survey house. Evaluations indicate significant forward strides in job creation, new businesses, expanded productivity, and enhanced international competitiveness. An agency evaluation of this project was last performed by the Department of Commerce in 1999.

RANGE POLICY DEVELOPMENT, NEW MEXICO

Mr. Skeen. Please provide a description of the research that has been funded under the Range Policy Development grant.

Response. The Range Policy Development project has collected local economic data throughout the State. Local data have been used to develop an economic model to help explain the relationships among local economies and primary industries. The model enables policymakers to better understand how local and State economies are tied to primary industries, especially those industries that use public lands. The initial focus of the project has been on the livestock grazing industry.

Mr. Skeen. According to the research proposal, or the principal researcher, what is the national, regional, or local need for this research?

Response. In New Mexico and throughout the western states, many local economies are dependent on the use and management of public range and forest lands. However, there exists a great deal of disagreement about the true level of dependence of individual communities on these public land-based industries and, consequently, disagreement about the local, statewide, and regional impacts of public policies that alter the use and management of these lands. Through better understanding of how public lands impact local and regional economies, we now can predict the outcomes of potential legislation or amended land use policies, resulting in policies that enhance, rather than detract from, local economies. The model was used to analyze the economic impacts of rangeland reform. The Bureau of Land Management --- BLM --- and Governor's State team chose to use the tool --- Input/Output Model --- and the method to analyze the Resource Advisory Council --- RAC---, fall back, and county alternatives for the State Environmental Impact Statement ---EIS---.

Mr. Skeen. What is the original goal of this program and what has been accomplished to date?

Response. The model has been requested by the U.S. Forest Service to help improve Region 3 Land Use Plan amendments in response to newly listed Threatened and Endangered Species. New Mexico is in the process of developing detailed input-output models for each county, from local and state tax revenue data. Economists are following up with workshops across the state to present information from economic forecasts to local decision makers. Further, the project calls for increasing the utility of the models by expanding the scope of the database to include oil, gas, cheese processing, dairy and food livestock industries in addition to the grazing enterprises.

Mr. Skeen. How long has this work been under way and how much has been appropriated through fiscal year 2000?

Response. This project was initiated in December 1994. The total appropriation for the project has been $1,162,240. The award of $197,000 for 2000 has been made to allow completion of the analysis of Draft EIS and Final EIS for BLM-U.S. Department of the Interior in conjunction with the State of New Mexico. The document is a proposed Statewide Resource Management Plan Amendment/Final EIS and is entitled "New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management."

Mr. Skeen. What is the source and amount of non-federal funds to support this project?

Response. The project budget does not indicate any non-federal support. However, Agricultural Research Stations in five other States have economists currently working to expand upon the New Mexico project, ultimately to build a regional model.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. According to the project director, most of the original objectives of the first phase have been accomplished. The second phase of the project was initiated September 15, 1999. This phase will investigate the hypothesis that recreation - in particular, Federal land based dispersed recreation - generates sufficient revenue to offset the significant and now documented economic contributions of the consumptive industries, such as range, forestry and mining, and crop and livestock agriculture. Recreation expenditure patterns and economic cycles will be investigated. Production agriculture and range livestock are vital segments of rural economies. These sectors produce sustainable long-term income and wealth and are the basis of the customs and culture of rural economies. The anticipated completion date is September 30, 2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The proposal for continued funding underwent merit review by an agency team of National Program Staff in May 1997, and a review of progress to date was conducted by the project liaison in September 1997. The reviews focused on criteria including the relevance of the project goals, the suitability of the proposed research methods, and the extent of progress made toward addressing the goals of the project. Both reviews found that phase one objectives had been met, and adequate progress had been made toward the objectives of the second phase of the project.

RURAL DEVELOPMENT, ALASKA

Mr. Skeen. Please provide a description of the program that has been funded under the Rural Development, Alaska Project.

Response. This program is being designed to assist technical assistance delivery to distressed communities in Alaska. The grant has not been distributed to date and no programmatic actions have occurred to date.

Mr. Skeen. What is the national, regional, or local need for this research?

Response. Changes occurring in the management and utilization of public lands and changes occurring in rural economies as a result of global competition and changing market conditions need to be assessed in terms of impacts on small and rural communities in distress.

Mr. Skeen. What was the original goal of this program and what has been accomplished?

Response. The original goal of this program was to improve technical assistance to distressed Alaskan rural communities.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year 2000?

Response. The work supported by this program began in fiscal year 2000 with an appropriation of $276,285.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. No non-federal funds have been provided for this project.

Mr. Skeen. Where is the work being carried out?

Response. The work is to be carried out in rural communities in Alaska.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original grant proposal has not been submitted to date.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. No program activities and no evaluation have been carried out to date.

RURAL DEVELOPMENT THROUGH TOURISM, NEW MEXICO

Mr. Skeen. Please provide a description of the program that has been funded under the Rural Economic Development Through Tourism--REDTT--Project in New Mexico.

Response. The Rural Economic Development Through Tourism Project involves applied research and outreach focused on locally-based tourism development strategies to enhance economic opportunity in small and rural communities in New Mexico. Components of the agenda support training of local leadership and tourism professionals, strategic planning and market development, and technical assistance to communities. Proposals submitted are submitted for internal review and evaluation within the agency. Recommendations are presented to enhance impact on regional and national agendas.

Mr. Skeen. What is the national, regional or local need for this program?

Response. This is an on-going pilot project to demonstrate the effective development and implementation of applied research, training, education, and technical assistance related to rural tourism as a development strategy. The grant has demonstrated that a long-term commitment of resources and activity

can lead to effective development of tourism resources and build new market opportunities and tourism products for small communities. This project would provide an excellent proposal for the Fund for Rural America.

Mr. Skeen. What was the original goal of this program and what has been accomplished?

Response. The applied research and outreach project was designed by the State Cooperative Extension Organization to increase the ability of the public sector to enhance economic opportunity for rural communities through tourism development. A regional task force composed of Extension professionals and community leaders from business, industry, education, and government--local, state, and Federal--was developed to guide and advise the development and implementation of locally-based programming and research. The results include video training materials, a public relations package, image studies and profiles, regional tourism guides, development of tourism bus packages, festival planning workshops, development of regional tours, and a mini-grants program for tourism development.

Mr. Skeen. How long has this work been underway and how much has been appropriated through fiscal year 2000?

Response . In fiscal years 1992 through 1995 the amount of $230,000 per year was appropriated. The appropriation for fiscal years 1996-1977 was $227,000 per year; for fiscal year 1998 was $247,000; for fiscal years 1999 and 2000, $280,000 per year. Total appropriated funds to date is $2,181,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Fiscal year 1992 included $38,764 in state matching funds. Fiscal years 1993, 1994, 1995 and 1996 included $39,360 per year of state matching funds. Fiscal years 1997 and 1998 include $39,040 per year state matching funds.

Mr. Skeen. Where is this work being carried out?

Response. Applied research and outreach is being carried out through New Mexico State University.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original completion date was September 30, 1993. The original objectives of this research have been met. The additional objectives being presented for the 1999 year will be completed by September 30, 2000. Year 2000 proposal has not been submitted to date.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency evaluates the merit of research proposals as they are submitted. No formal evaluation of this project has been conducted. The principal investigators and project managers submit annual reports to the agency to document impact of the project. Each year, the project has demonstrated significant accomplishment in the reports submitted. Impacts include significant increases in attendance of local festivals, increase in number of tour bus visits to New Mexico, training to over 700 tourism

employees in the region, and establishment of a number of new businesses. Agency evaluation of the project includes peer review of accomplishments and proposal objectives and targeted outcomes.

RURAL DEVELOPMENT, OKLAHOMA

Mr. Skeen. Please provide a description of the program that has been funded under the Rural Development, Oklahoma Project.

Response. This program provides financial and technical assistance to small business to create and retain jobs in rural Oklahoma and to stimulate the local economies. The program is carried out through financial services, business incubators, problem-solving assistance to small and medium-sized manufacturers and technical assistance to rural small businesses. The program is expanding to include assistance to rural small businesses to enter international trade. The program continues to evaluate new products and processes that may result in new industries or be applied to improve existing manufacturing processes. The project has undergone a merit review.

Mr. Skeen. What is the national, regional, or local need for this research?

Response. The increased demand for small business financing and technical assistance verifies the need for the program. Each year financing secured for small businesses has significantly increased. The demand for business incubators is also on the rise. Last year, Rural Enterprises, REI agreed to manage two more business incubators bringing the total REI-managed facilities to thirteen. Also, small businesses continue to need access to technical and business management assistance, worker training, and international trade assistance in order to stay competitive in domestic and world markets.

Mr. Skeen. What was the original goal of this program and what has been accomplished?

Response. The original goal of the program was to create jobs in rural Oklahoma by providing systematic access to improved technology, training, financial and business management assistance. REI is a Certified Development Corporation for the Small Business Administration as well as a designated Certified Development Financial Institution. As a result, REI has been successful in obtaining financing for entrepreneurs and rural small businesses totaling $119,060,129. Special technical assistance efforts have included problem-solving assistance to small manufacturers; training and dissemination of information on ISO9000 to assist rural businesses compete with a global market; providing manufacturers with a "Quick View Assessment" program which enables manufacturers to compare their facilities and operations with other companies across the United States; and working one-on-one with small businesses providing on-site assistance with inventory control, cash flow management, and marketing.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. Appropriations to date are as follows: $433,000 per year in fiscal years 1988-89; $430,000 in fiscal year 1990; $431,000 in fiscal year 1991, $300,000 per year in fiscal years 1992-95; $296,000 per year in fiscal years 1996-97; $150,000 per year in fiscal years 1998-2000. Appropriations total $3,969,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. No non-federal funds have been provided for this project.

Mr. Skeen. Where is this work being carried out?

Response. The work is being carried out at Rural Enterprises, Inc.,REI in Durant, Oklahoma.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. The original proposal in 1988 was for a period of 12 months. However, the objectives of Rural Enterprises, Inc. are on-going because of the nature of the activity. The clientele is diverse and decentralized. The engineering and management consultation model being pursued with individual clients results in a situation where hundreds of problems are being pursued simultaneously and when solved are replaced by new issues resulting from international competition, regulations, training needs, and changeover costs. The next phase of the program will be completed in FY2000.

Mr. Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. REI itself conducts an on-going evaluation process to measure the organization's effectiveness and efficiency in accomplishing its objectives and this is documented on a quarterly basis through our reporting system. Over 6,000 jobs have been created and retained for new and expanding businesses as a result of this program. While the program has met its key objective of job creation in rural Oklahoma, the nature of its outreach effort continues to evolve and change as business sustainability and profitably confront new challenges within small and rural communities.

RURAL REHABILITATION, GEORGIA

Mr. Skeen. Please provide a description of the program that has been funded under the Rural Rehabilitation project in Georgia.

Response. The program has tested the feasibility of providing satellite-based adult literacy education, in association with vocational rehabilitation services, to handicapped adults in rural Georgia. The program has developed curriculum, tested and adapted technology, established student recruitment and retention strategies, expanded to Statewide coverage, and provided successful adult literacy education.

Mr. Skeen. What is the national, regional, or local need for this program?

Response. A state task force has estimated that 25 percent of Georgia's adult population is functionally illiterate. Functional illiteracy is regarded in Georgia as a form of disability. The extent of adult functional illiteracy is similar throughout much of rural America.

Mr. Skeen. What was the original goal of this program and what has been accomplished to date?

Response. The original goal of this program was to prove that distance learning can be an effective tool for reaching and teaching functionally

illiterate adults in rural areas. This program has demonstrated that satellite-based literacy training, in cooperation with vocational rehabilitation services, can successfully provide adult literacy education designed to improve critical reading, writing, and thinking skills, for handicapped rural adults. Over the past 9 years, test scores and attendance and completion rates of students in the satellite-based program have shown that distance learning is an effective delivery system for instructing low-level readers and non-readers. Test scores and attendance rates of students in this program have been comparable to those of students in traditional, urban classes. The project is currently working to perfect a process for internet based instruction and student assessment.

Mr. Skeen. How long has this work been underway and how much has been appropriated by fiscal year through Fiscal Year 2000?

Response. Funding for this program was initially appropriated in Fiscal Year 1989, and the program has been in operation since March 1989. Through Fiscal Year 2000, appropriations for this program have been as follows: $129,000 in Fiscal Year 1989; $256,000 in Fiscal Years 1990, 1991, and 1992; $250,000 in Fiscal Years 1993, 1994, and 1995; and $246,000 in Fiscal Years 1996, 1997, 1998, 1999 and 2000 for a total of $2,877,000.

Mr. Skeen. What is the source of and amount of non-federal funds provided by fiscal year?

Response. The Fiscal Year 1998 source of non-federal funds provided for this program are state appropriated funds from the Georgia Department of Adult Education. Prior years sources also included private contributions from the Woodruff Foundation and other local foundations. Through Fiscal Year 1998, the total amount of non-federal funds provided the project has been $8,006,901. The breakdown by Fiscal Year is: $164,000 in Fiscal Year 1988; $270,500 in Fiscal Year 1989; $809,675 in Fiscal Year 1990; $656,765 in Fiscal Year 1991; $65,000 in Fiscal Year 1992; $1,019,821 in Fiscal Year 1993; $20,000 in Fiscal Year 1994; $872,500 in Fiscal Year 1995; $1,500,000 in Fiscal Year 1996; $1,319,320 in Fiscal Year 1997; and $1,309,320 in Fiscal Year 1998.

Mr. Skeen. Where is this work being carried out?

Response. The Georgia Tech Satellite Literacy Project is sponsored and operated by four organizations: Georgia Institute of Technology's Center for Rehabilitation Technology, the Center for Rehabilitation Technology, Inc., Literacy Action, Inc., and the Georgia Department of Technical and Adult Education. The program grantee is CRT, Inc., a private, not-for-profit business advisory board to the Center for Rehabilitation Technology, College of Architecture, Georgia Institute of Technology, from which the literacy instruction has been provided.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project? Have those objectives been met? What is the anticipated completion date of additional or related objectives?

Response. It was anticipated that it would take 3 years to demonstrate that distance learning can be an effective tool for reaching and teaching functionally illiterate adults in rural areas. That original objective was met in Fiscal 1991. Additional objectives since Fiscal Year 1991 have been to expand the outreach of the satellite based adult literacy program to enough additional sites throughout the State of Georgia so that all potential participants have reasonable access to the program, and to continually upgrade

the quality of class programming and the technical capacities of the system. The Fiscal Year 1997 technological upgrades expanded the capacity of the program more than 25-fold, from 77 to over 2,000 downlink sites, and a six-fold increase in broadcast hours, and made materials available as supplemental tools to all Georgia literacy classes. As of December 1997, the Georgia Tech Satellite Literacy Program is in a period of transition from that of providing literacy instruction via direct television broadcasts to classrooms to that of development and dissemination of technology-based instructional aids. The project has been renamed the Lifelong Learning Network, or LNN. This change is being made based upon the request of the major sponsor, the Georgia Department of Technical and Adult Education, Office of Adult Literacy. The LNN will develop and produce video-based instructional supplements, technology-based curriculum and training for adult literacy practitioners, and multi-media projects for literacy students.

Mr Skeen. When was the last agency evaluation of this project? Provide a summary of the last evaluation conducted.

Response. The agency receives annual reports on the project that are used, together with agency merit review, to assess its progress. Based on these reports, the agency has found that the project has made steady progress in demonstrating the feasibility of utilizing distance learning technology and teaching methods to provide adult literacy education programs to handicapped adults throughout the State of Georgia. The project has been successful in applying the latest distance education technology to both control the program cost per participant and, most recently, to expand the availability of the program.

WOOD BIOMASS, NEW YORK

Mr. Skeen. Please provide a description of the research that has been funded under the Wood Biomass Grant?

Response. The objective of this project is to expand, implement, and gain acceptance of short rotation woody crop biomass as a sustainable, renewable and environmentally friendly fuel source and as a feedstock for conversion into biobased industrial products. In addition, the project is supporting the promotion of low value fiber from the Nation's Central and Northern Hardwood forests regions.

Mr. Skeen. According to the research proposal, or the principal researchers, what is the national, regional, or local need for this research?

Response. The principal researchers hypothesize that the project is of national interest. Biomass research studies through the U.S. Departments of Agriculture and Energy span 20 or more years. This work clearly demonstrates that the nation is in a position to scientifically produce environmentally affable fuels for power generation systems and other biobased industrial products. Except for co-generation plants, the current cost of conventional power supply fuels currently precludes the wholesale adoption of this technology. Complementing the planned fuel supply are many sidebar benefits including carbon offsets and sequestration, rural economic development, wildlife habitat, and reduction in soil erosion sedimentation and non-point source pollution associated with conventional agriculture. Valuing these and other products will make the economics of the system much more attractive. The applied research on the production system will be applicable across the Northeastern and Midwestern United States. Knowledge gained and lessons

learned during the project will be applicable to similar projects across the country. The project is awarded non-competitively, but it is annually subjected to a CSREES Merit Review.

Mr. Skeen. What was the original goal of this research and what has been accomplished to date?

Response. The goal of this project is to promote, through applied research and technology transfer, wood biomass as a sustainable wood supply for (1) power generation and other biobased industrial products, (2) alternative farm products, (3) wise stewardship of land resources, and (4) enhanced farm profitability.

To accommodate these goals, scientists at the State University of New York College of Environmental Science and Forestry--SUNY-ESF--are planting willow trials and demonstration areas on several sites. Site preparation trials - including the use of cover crops, reduced tillage practices, and different herbicide regimes - and planting has occurred on several locations. Cornell University, a partner institution in the project, has hired a technology transfer specialist to coordinate educational activities resulting from this work. Common events include field days, news articles, presentations, tours of the demonstration farms, and exhibits.

Mr. Skeen. How long has the work been underway and how much has been appropriated by fiscal year through fiscal year 2000?

Response. This aspect of the program began with an appropriation of $200,000 in fiscal year 1995. An additional $197,000 was appropriated by the Congress for fiscal years 1996 through 2000. This sums $1,185,000.

Mr. Skeen. What is the source and amount of non-federal funds provided by fiscal year?

Response. Four state partners and approximately 18 private partners contribute resources at a ratio of nearly 1.5 to 1 for this project.

Mr. Skeen. Where is the work being carried out?

Response. The fieldwork is being conducted on private and state land near Syracuse, New York. Electronic and print media allows Cornell's and SUNY-ESF's technology transfer activities to extend far beyond that point. Presentations have been made at international, national, and regional conferences and workshops. Numerous presentations have been made to local groups across the northeastern United States. The demonstration farms established under this project have been toured regularly by visitors from across the country and around the world.

Mr. Skeen. What was the anticipated completion date for the original objectives of the project. Have those objectives been met? What is the completion date of additional or related objectives?

Response. The completion date for the original objectives of the project, willow cultivar planting was September 30, 1996. With the addition of some new dimensions to the project and the need to monitor the plots through the first growing cycle of 4 years, the completion date is now 2003. Because of the timing of one of the fiscal awards, some weather related problems and some land contract problems, all of the original objectives have not been met. Most of the unmet objectives should be completed in 2000.

Mr. Skeen. When was the last agency evaluation of the project? Provide a summary of the last evaluation conducted.

Response. A field review of the project was conducted on August 20-21, 1997. Excerpts from the review report include (1) positive accolades for their quarterly progress reports, (2) positive accolades for the outreach program being conducted by Cornell University, (3) praise for the scientific outreach by the principal investigators, (4) praise for connecting the willow biomass program to the poultry waste and riparian issues in New York state, and (5) praise for gaining the acceptance of willow biomass as an agricultural crop for state property tax purposes. On the concern side CSREES' project administrator flagged the delay in establishing the demonstration farm and requested diligence in bringing this aspect of the project to fruition. Subsequent reports from the project reveal that this aspect has been satisfactorily addressed. In addition to the above, the project is annually reviewed by the Salix (willow) Consortium.

FEDERAL ADMINISTRATION

Mr. Skeen. Please provide a summary table that shows by Federal Administration Grant the following: title, need, goal, beginning year, target completion date, cumulative appropriated funding through fiscal year 1998, appropriated fiscal year 2000 funding, non-federal funding amount in fiscal year 2000, and linkages with other USDA or Federal agencies.

(The information follows.)

SUMMARY OF FEDERAL ADMINISTRATION GRANTS
RESEARCH AND EDUCATION ACTIVITIES:

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	FY 2000 Non-Federal Funding Amt.	Linkages b/
Agricultural Development in the American Pacific	R	To enhance the impact of five American Pacific institutions on tropical agriculture and communities.	1994	Beyond 2000	3,391,000	564,000	None	None
Agricultural Waste Utilization, WV	L,N	To validate the applicability and effectiveness of anaerobic filtration for treating municipal and agricultural wastes.	1998	2001	610,000	425,000	None	None
Animal Waste Management, OK	R	To develop sustainable, environmentally-safe, and ecologically-sound best management principles and practices for beneficial animal waste applications.	1998	2003	500,000	250,000	Not reported	ARS
Biotechnology Research, MS	L,R	To enhance research efforts in biotechnology through genetic improvement research.	2000	2002	--	425,000	Not reported	WB
Center for Agriculture and Rural Development, IA	N	To provide current economic information on international trade in agriculture.	1989	Beyond 2000	6,769,000	355,000	Not reported	None
Center for Innovative Food Technology, OH	R,N	To develop innovative processing techniques to increase food safety and quality.	1995	2001	1,205,000	381,000	Not reported	None
Center for North American Studies, TX	N	To promote strong agricultural ties with Mexico and Canada.	1994	2001	523,000	87,000	Not reported	None
Climate Change Research, FL	L	To improve prediction of weather forecasting.	2000	Not reported	--	170,000	Not reported	NOAA
Cotton Research, TX	L	To improve cotton production in West Texas and expand the demand for cotton grown in the area.	1998	2004	400,000	170,000	Not reported	None
Curriculum Development/ Mississippi Valley State University	L	To strengthen university capacity and curriculum development.	1987	2000	8,064,000	583,000	Not reported	None

SUMMARY OF FEDERAL ADMINISTRATION GRANTS

RESESEARCH AND EDUCATION ACTIVITIES:

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	FY 2000 Non-Federal Funding Amt.	Linkages b/
Data Information System	N	To develop an information system that provides real-time tracking of research, extension, and education projects and programs.	1997	2000	2,200,000	2,000,000	None	None
Geographic Information System	L,R	To promote collaborative and innovative transfer of systems technologies related to natural resources to local governments.	1990	Not reported	8,600,000	850,000	1,000,000	NRCS, EPA USGS
Gulf Coast Shrimp Aquaculture	N	To increase domestic production of marine shrimp through aquaculture.	1985	2001	42,102,000	3,354,000	1,677,000	ARS, APHIS, DOC, EPA, FDA
Livestock Marketing Information Center, CO	N	To increase the ability of livestock producers to make good business decisions in a changing global economy.	2000	Not reported	--	170,000	Not reported	ERS, APHIS, GIPSA
Mariculture, NC	N	To develop sustainable aquaculture production systems for marine finfish.	1998	2002	400,000	250,000	Not reported	ARS, DOC
National Alternative Fuels Laboratory	R,N	To develop a database of at-the-pump-sampled conventional, reformulated, and alternative transportation fuels.	1991	2002	2,061,000	218,000	Not reported	DOE, EPA
National Center for Peanut Competitiveness	R	To enhance the competitivenss of the U.S. peanut industry by examining alternative production systems.	1998	2002	450,000	300,000	Not reported	None
PM-10 Study, CA and WA	L,R	To address the effects of emissions of PM-10 and PM-2.5 sized particulates from agricultural land on air quality and development of control strategies.	1994	2000	5,247,000	873,000	Not reported	ARS, EPA, NRCS
Precision Agriculture, AL & TN	R	To provide training for farmers in the use of precision farming technology.	1999	2004	500,000	425,000	None	NASA
Water Quality, IL	R	To coordinate and support research on agricultural chemicals in Illinois groundwater.	1990	Beyond 2000	5,118,000	297,500	None	ARS, NRCS EPA, NSF
Water Quality, ND	R,N	To develop an understanding of the occurrence, transport, and fate of agricultural chemicals found in field settings in the Northern Great Plains.	1989	Beyond 2000	6,262,000	340,000	Not reported	ARS, NRCS EPA, NSF

EXTENSION ACTIVITIES:

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	FY 2000 Non-Federal Funding Amt.	Linkages b/
Ag in the Classroom	N	To promote agricultural literacy among the youth of the nation.	1987	Not reported	2,253,880	208,000	None	None
Beef Improvement, AR	L,R	To enhance the efficiency and profitability of the Arkansas cattle producer.	1993	2003	1,388,000	197,000	Not reported	None
Botanic Garden Initiative, IL	L,R,N	To increase student interest and understanding of science and other related subjects using gardens as the focus.	2000	2005	--	106,263	Not reported	DOEd
Conservation Technology Transfer, WI	R	To provide education and technical support to livestock producers regarding animal waste.	2000	2001	--	170,022	600,000	NRCS
Delta Teachers Academy	R	To address the problem of insufficient professional development opportunities for elementary and secondary teachers in the Lower Mississippi Delta region.	1994	2002	20,661,000	3,500,000	None	None
Diabetes Detection and Prevention, WA and HI	N	To support demonstration and outreach activities designed to detect undiagnosed diabetes.	1999	2004	550,000	550,000	None	NIH, CDC
Extension Specialist, MS	L,R	To collect, maintain, and disseminate weather information for producers and researchers in Mississippi and surrounding states.	1997	Not reported	200,000	100,000	Not reported	ARS
Income Enhancement Demonstration, OH	L	To enhance the competitiveness for agricultural firms and create greater economic opportunity for local residents.	1991	2001	2,129,000	246,000	Not reported	None
Integrated Cow-Calf Management, IA	L,R	To improve the long-term profit potential of the local cattle industry.	1992	2003	2,192,000	250,000	Not reported	None
National Education Center for Agricultural Safety, IA	L,R,N	To test the efficacy of adapting practical hands-on training methods for reducing the level of preventable farm work incidents in the U.S.	1998	2001	390,000	195,000	Not reported	None

Title	Need a/	Goal	Beginning Year	Target Completion Year	Cumulative Funding through FY 1999	FY 2000 Appropriation	FY 2000 Non-Federal Funding Amt.	Linkages b/
Pilot Technology Transfer Projects, OK and MS	L,R,N	To transfer uncommercialized technologies from Federal laboratories and universities to rural businesses and communities.	1984	2000	5,326,000	326,000	Not reported	None
Pilot Technology Project, WI	L,R,N	To develop a competitive, secure manufacturing base through the mechanism of industrial extension.	1992	2000	1,312,000	163,000	24,367	NIST
Range Policy Development, NM	L,R	To develop detailed input-output models for each county in New Mexico from local and state tax revenue data.	1994	2000	965,240	197,000	None	None
Rural Development, AK	L	To improve technical assistance to distressed Alaskan rural communities.	2000	Not reported	--	276,285	None	None
Rural Development, OK	L	To create jobs in rural Oklahoma by providing systematic access to improved technology, training, financial, and business management assistance.	1988	2000	3,819,000	150,000	None	None
Rural Development Through Tourism, NM	L	To enhance economic opportunity for rural communities through tourism development.	1992	2000	1,901,000	280,000	Not reported	None
Rural Rehabilitation, GA	L	To test the feasibility of distance learning as an effective tool for reaching and teaching functionally illiterate adults in rural areas.	1989	Not reported	2,631,000	246,000	Not reported	None
Wood Biomass, NY	N	To expand, implement, and gain acceptance of wood biomass as a sustainable, renewable, and environmentally-affable fuel source.	1995	2003	986,000	197,000	Not reported	DOE

a/ Local (L), Regional (R), and National (N)

b/ USDA agencies:
APHIS-Animal and Plant Health Inspection Service
ARS-Agricultural Research Service
ERS-Economic Research Service
GIPSA-Grain Inspection, Packers and Stockyards Administration
NASS-National Agricultural Statistics Service
NRCS-Natural Resouces Conservation Service

Other Federal agencies:
CDC-Centers for Disease Control
DOC-Department of Commerce
DOE-Department of Energy
DOEd-Department of Education
EPA-Environmental Protection Agency
NASA-National Aeronautics and Space Administration
NIH-National Institutes of Health
NSF-National Science Foundation
USGS-U.S. Geological Survey
WB-World Bank

BUILDINGS AND FACILITIES

Mr. Skeen. For the record, please provide a list of all projects and tell us the status of each, including the amount that has been appropriated to date and the amount of Federal funds needed to complete the project. This list should include all feasibility studies as well.

Response. A number of projects expected additional Federal funds when the last appropriation for this program was made in 1997. Several grantees have elected to scale back their projects to meet the funds currently available. Some grantees are continuing to seek additional non-Federal funds before the deadline of September 30, 2000. The information on the incomplete projects is provided in the chart below. All feasibility studies for Buildings and Facilities projects were conducted at the beginning of these projects and were forwarded to Congress for review at that time.

CSREES BUILDINGS AND FACILITIES PROGRAM

PLANS FOR COMPLETING FACILITIES

Name and Location of Facility	Total Cost of Project Status of Funds	Plan to Complete Facility
Poultry Science Facility **AUBURN UNIVERSITY** (Auburn, AL)	Cost of Project: $ 17,000,000 Federal Funds Awarded: $ (5,820,000) Match Obtained: $(11,652,000) BALANCE NEEDED to COMPLETE PROJECT*: $ - 0 - *Breakdown of $ Needed: Federal Support: $ - 0 - Match Needed: $ - 0 -	Funds are anticipated at $5,500,000 from the State of Alabama Bond Issue; $500,000 from the State Legislature; and $5,180,000 for Auburn University Funds for a total of $11,180,000. The cost of the project has increased from $15M to $17M as the University is expanding the building to include nutrition and food science. This expansion is pending approval of CSREES.

Name and Location of Facility	Total Cost of Project Status of Funds	Plan to Complete Facility
Alternative Pest Control Containment/Quarantine Facility **UNIVERSITY OF CALIFORNIA** (Davis/Riverside)	Cost of Project: $ 26,155,370 Federal Funds Awarded: $ (10,593,370) Match Obtained: $ (15,562,000) BALANCE NEEDED to COMPLETE PROJECT*: $ - 0 - *Breakdown of $ Needed: Federal Support: $ - 0 - Match Needed: $ - 0 -	Funds have been received in the amount of $11,568,000 from the State; $3,919,000 from University; and an in-kind match of $75,000, for a total of $15,562,000. CSREES received verification from the State of California, Department of Finance and the University. Although downsizing was not a preferred option in prior years, the scope of the project is being reduced consistent with the $26,155,370 available for the porject. Therefore, no additional funds are needed to complete this project. The university has stated that the proposed in-kind contribution of $3M for land is no longer anticipated.
Agricultural Biotechnology Laboratory **UNIVERSITY OF CONNECTICUT** (Storrs)	Cost of Project: $ 20,000,000 Federal Funds Awarded: $(3,797,550) Match Obtained: $(10,000,000) BALANCE NEEDED to COMPLETE PROJECT*: $ 6,202,450 *Breakdown of $ Needed: Federal Support: $ 6,202,450 Match Needed: $ - 0 -	Matching funds in the amount of $10M were obtained from the State. With $13,797,550 in hand, plans are proceeding to complete Phase 1 (research laboratory/ office wing). Funds needed to complete Phase 2 (greenhouse complex) and Phase 3 (administrative wing) will be sought from private sources. Recipient anticipates obtaining all remaining funds needed within specified time frame to complete Phases 2 and 3.

Name and Location of Facility	Total Cost of Project Status of Funds	Plan to Complete Facility
Center for Molecular Biology **RUTGERS UNIVERSITY** (New Brunswick, NJ)	Cost of Project: $ 47,200,000 Federal Funds Awarded: $ (17,252,420) Match Obtained: $ (29,947,580) BALANCE NEEDED to COMPLETE PROJECT*: $ - 0 - *Breakdown of $ Needed: Federal Support: $ - 0 - Match Needed: $ - 0 -	Funds needed to complete the facility have been committed by the University General Administration and the New Jersey Agricultural Experiment Station.
Center for Research on Human Nutrition and Chronic Disease Prevention **WAKE FOREST UNIVERSITY** (Winston-Salem, NC)	Cost of Project: $ 108,607,174 Federal Funds Awarded: $(17,564,760) Match Obtained: $ (50,607,174) BALANCE NEEDED to COMPLETE PROJECT*: $ 40,435,240 *Breakdown of $ Needed: Federal Support: $ 40,435,240 Match Needed: $ - 0 -	Funds needed to complete the facility are being sought from public and private sources. Effective 09/30/98, the University was awarded a competitive grant from the National Institutes of Health (NIH) in the amount of $943,666, which will be used to finish the fifth floor where the Functional Imaging Program will be housed. In 5/99, the University received another grant in the amount of $985,300 from NIH to finish the fourth floor for cancer research with a focus on nutrition and cancer. The University will contribute 100 percent matching funds to the NIH grant. CSREES has agreed to accept a pro rata share of the completed building (the percentage which the USDA investment of $17,564,760 represents of the total cost of construction).

Name and Location of Facility	Total Cost of Project Status of Funds	Plan to Complete Facility
Animal Care Facility **NORTH DAKOTA STATE UNIVERSITY** (Fargo)	Cost of Project: $ 5,175,920 Federal Funds Awarded: $ (2,587,960) Match Obtained: $ (2,207,500) BALANCE NEEDED to COMPLETE PROJECT*: $ 380,460 *Breakdown of $ Needed: Federal Support: $ - 0 - Match Needed: $ 380,460 $ - 0 -	Plans to complete the project involve reducing the project costs from $10,000,000 to $5,175,920: The University will construct a Large (Livestock) Animal unit and a scaled-back Small (Laboratory) Animal Facility, as well as replace an incinerator at the Veterinary Diagnostic Laboratory. At the University's request, $727,500 was reprogrammed from the Food Processing Pilot Plant project at the University to this project. To date, the State has appropriated $2,207,500. The remaining matching funds will be provided by the State and private sources.
Coastal Institute on Narragansett Bay **UNIVERSITY OF RHODE ISLAND** (Kingston)	Cost of Project: $ 24,322,532 Funds Awarded: $ (12,125,000) Match Obtained: $(12,197,532) BALANCE NEEDED to COMPLETE PROJECT*:$ - 0 - *Breakdown of $ Needed: Federal Support: $ - 0 - Match Needed: $ - 0 -	Plans to complete the project involve reducing the scope from 6 to 4 buildings. Recipient will build the Center for Atmospheric Chemistry, Coastal Institute - Bay Campus, Coastal Institute - Main Campus, and Aquaculture Field Laboratory. The Classroom Building and Life Sciences Building will not be built. As a result of scaling back the number of buildings, project costs were reduced; therefore, no additional funds are required to complete the project.

NRI GRANTS AWARDED IN 1999

Mr. Skeen. Please update the chart printed on page 1754 of last year's hearing record to reflect the grants awarded in 1999.

(The information follows.)

National Research Initiative Competitive Grants Program
Proposals Submitted For and Grants Awarded From the Fiscal Year 1999 Appropriations

Performing Organization	Proposals Received	Grants Awarded in FY 1999	Percentage of Grants Awarded of Proposals Received	Dollars Requested	Dollars Awarded in FY 1999	Percentage of Dollars Awarded of Dollars Requested
1862 Land-Grant Universities	1,896	304	16%	475,708,694	50,214,563	11%
1890 Land-Grant Universities	49	2	4%	16,397,581	74,865	.5%
Non Land-Grant Public University or College	360	51	14%	91,653,609	7,751,743	8%
Private University or College	141	25	18%	30,263,692	4,402,942	15%
Private Non-Profit	91	21	23%	31,602,100	3,472,393	11%
Private For-Profit	27	2	7%	7,134,710	520,150	7%
State, Local, or Tribal Government	5	0	0%	1,046,935	0	0%
USDA Agencies - ARS, ERS, FS	93	12	13%	23,963,985	2,068,145	9%
Other Federal Agency/Department	33	2	6%	8,977,963	310,000	3%
Individual	20	0	0%	1,747,197	0	0%
Other	21	3	14%	8,215,210	331,172	4%
TOTAL	2,736	422	15%	696,711,676	69,145,973	10%

NRI GRANTS AWARDED IN 1999

Mr. Skeen. Of the NRI grants awarded how much funding and how many grants were awarded to ARS? What were the grants for?

Response. Eighteen NRI grants were awarded to ARS for a total of $3,070,681. The purpose of each grant is as follows:

1.Evaluating Indirect Ecological Effects of Biological Control: A Symposium Workshop. Funds will be used to support an international workshop to evaluate the effects of biological control agents on non-target species.

2. Microarray Analysis of Soybean Gene Expression Induced by Soybean Cyst Nematodes. This grant will identify and characterize genes expressed in soybeans in response to Soybean Cyst Nematode invasion with the goal of developing plants that are resistance to the pest.

3. Polydnavirus-based transformation of insect cells. Funds will be used to to develop and test a gene transfer system for insects as a tool to identify, isolate, and characterize genes. Understanding the genes of insects can lead to more effective ways of pest control, including the development of more effective biological control agents.

4. Adding Value to Lower Quality Beef Muscles. Beef is declining in market share due to perceived inconsistency in eating quality resulting in consumer dissatisfaction with the value they received per dollar expended. This project would determine the relative contribution of the three primary sources of variation in the tenderness of different beef muscles--connective tissue, muscle shortening, and protein degradation during aging. The information which would enable the beef industry to develop cut-specific tenderization strategies, thereby improving tenderness, value, and consumer satisfaction.

5. Field Release of Phorid Flies for Classical Biocontrol of Imported Fire Ants. This grant will be used to study the effectiveness of Phorid flies in controlling fire ant populations as an alternative to more conventional methods that include pesticides.

6. Gene-transfer vector and marker analysis in insects of economic importance. Funds will be used to develop and test gene transfer methods in insects as a tool to study transgene expression. Gene transfer in insects will be important to the development of more effective biological control.

7. Mapping, BAC Recovery, and Positional Cloning of Loci Involved in Fertility Restoration. Funds will be used to study fertility restorer genes involved in the production of hybrid sorghum seed.

8. Modeling Bacterial Pathogen/Biocontrol Competition with Changing Temperature. This proposal addresses the President's National Food Safety Initiative to predict and prevent the growth of harmful bacteria in foods. A multi-disciplinary approach will study the competition of microorganisms in foods, including biochemistry, microbiology, mathematics, and computer simulation models.

9.Tenth International Symposium on Iron Nutrition and Interactions in Plants. This grant provides partial support for a conference to bring together scientists to exchange new knowledge, ideas, and techniques, and to provide stimulus for future collaborations in the area of plant iron nutrition, an important field that has relevance not only to crop health and productivity but also to the nutritional content of harvested foods for human and animal consumption.

10. Lignins in Lignin-biosynthetic-Pathway Mutants and Transgenics. Utilization of plant resources--e.g., for paper--is often limited by the difficulty of dealing with lignin--the polymer that binds the fibers together and confers structural rigidity. This grant will characterize the lignin structure in a variety of just-available mutant and transgenic plants--in which the various lignin biosynthetic pathway enzymes have been down- or up-regulated--to provide further insight into plant processes and to target new ways of altering lignin for improved utilization of plant fibers

11. 12th International Congress on Nitrogen Fixation. Funds will be used to support an international conference on recent advances in nitrogen fixation and metabolism in crops such as alfalfa and soybean and its impact on crop prduction and quality.

12. A Survey of Microsatellite Variation in U.S. Corn Belt Germplasm. Funds will be used to study genetic diversity in corn using molecular makers called microsatellites. Genetic studies such as these are important to unlocking genetic mechanisms used in crop efficiency and protection.

13. Genomic and Physical Organization of Fertility Restorer Genes in cms-T Maize. Funds will be used to study how genes involved in cytoplasmic male sterility, called CMS, are expressed in the plant. CMS remains a widely used tool by breeders for the production of hybrid seed in a number of economically-important crops including corn, sorghum, rice, wheat, sunflower, and beans.

14. Verification of QTL for Resistance to Marek's Disease in Commercial Chickens. Researchers have identified and will study a number of genes in several commercial chicken lines in order to promote resistance in chickens to Marek's disease, the leading chronic disease of poultry and a $1 billion per year problem.

15. Optimizing & Validating a Novel Mark-Release-Recapture Method. The goal of the research will be 1) to validate the use of protein markers for dispersal studies of parasitoids--wasps that are parasites--of the silverleaf whitefly, 2) to quantify parasitoid dispersal, and 3) determine what factors influence parasitoid dispersal. Information from these studies will increase understanding about parasitoid behavior and better manage them for biological control of plant pests.

16. Positional Cloning of the Rice Submergence Tolerance Gene Sub1. Funds will be used to isolate and clone a gene in rice called Sub1 that confers tolerance to flooding, greatly improving the liklihood of producing flood tolerant crops.

17. The Role of SLEEPY1 (SLY1) in GA Signal Transduction. Funds will be used to characterize the gene called SLY1 needed for plants to respond to the growth hormone called gibberillin. Plant hormones stimulate critical processes in plant growth and development including stem elongation, flower initiation, and germination. An understanding of the SLY1 gene will provide an important tool for manipulating plant hormone regulated processes central to agriculture including pre-harvest germination, stand establishment, lodging, and yield.

18.Basis of Increased Virulence of Newly Emerged Asian Foot-and-Mouth Disease Virus. In the spring of 1997, an outbreak of foot-and-mouth disease occurred in Taiwan which displayed an altered pattern of infection when compared to the virus strains found in Europe and South America. This particular virus infected swine causing high morbidity and mortality and was unable to infect cattle. The genetic basis of this pattern is being investigated to find ways to combat the disease internationally as well as domestically.

ARS scientists also participate in a large number of NRI grants as co-principal investigators and collaborators

NATIONAL RESEARCH INITIATIVE

Mr. Skeen. The fiscal year 2001 budget proposed $150 million for the National Research Initiative, reflecting an increase of $30.7 million. Please provide the Committee with a detailed description of projects included in each of the NRI categories for fiscal year 2000 and an explanation of the increases in each category for fiscal year 2001.

Response. A detailed list of supported projects from the fiscal year 2000 appropriation for the National Research Initiative--NRI--is not yet available because the peer review panels have not completed their evaluations for the submissions. We can, however, summarize the areas of emphasis that will be funded in fiscal year 2000.

Increased funding in fiscal year 1999 allowed the NRI to expand into critical areas that could not have been supported without the increased allocation. These expanded areas continue in fiscal year 2000. In fiscal year 1999, the NRI was also able to support a limited number of larger monetary awards fostering virtual centers of expertise and stronger collaborative partnerships among the scientific community, commodity organizations, private industry, and Federal partners. Further, the increased funds allowed the NRI to more fully fund approved projects that address high priority issues. For example, the average award from the NRI in fiscal year 1998 was approximately $146,000, an amount that includes indirect costs, for 26 months. The average award for FY 1999 was $165,000, almost a 15 percent increase in award size. These policies of larger award size and higher success rate are goals to be continued in fiscal year 2000.

New funding categories from FY 1999 are continued in fiscal year 2000, including Animal Genome Reagents and Tools, Epidemiological Approaches for Food Safety, U.S. Rice Genome Sequencing Project, and an emphasis on small and mid-sized farm issues in the Agricultural Systems Program.

The NRI is designed to support fundamental and mission-oriented research to increase base knowledge that will ultimately be applied to problems in agriculture. Funding increases requested in FY 2001 will be used to: speed up the progress in the development of basic reagents and tools for genomics, such as libraries; high density comparative maps and other tools that are necessary to understand the organization and function of plant and animal genomics; to support projects that capture gains from biotechnology for production of new agricultural end uses; to close gaps in knowledge for food safety and the risk factors involved in the production of food from farm to table; to identify emerging and re-emerging food borne diseases through enhanced or new surveillance methodologies; to provide for a better understanding of population and community dynamics of invasive species; to better understand the possible impacts of global environmental change on the sustainability of agriculture and forestry; to provide more funding for agricultural systems research which bridge biological, physical, and social sciences; to support research on added economic and social sciences associated with new and alternative crops; and to expand research into natural resources and environmental economics and their impact upon competitive of the U.S. agricultural sector.

Mr. Skeen. How do the competitive research grants under the NRI differ from the competitive grants being delivered under the Initiative for Future Agriculture and Food Systems?

Response. The two programs are quite different in their substance and expected outcomes, yet together become a complementary way to support projects that range from fundamental science to application and dissemination of knowledge for practical problem solving.

The NRI is authorized as a research program only. The Initiative for Future Agriculture and Food Systems--IFAFS--is authorized for research, education, and extension. The NRI provides for the generation of fundamental and mission-oriented knowledge that will be applied to agricultural issues. The NRI supports longterm projects, where the actual impact of the results may be unknown, yet the project contributes greatly to increasing the knowledge base of agricultural science. This assures that future or unpredicted problems in agriculture will have a base of knowledge from which to find solutions. IFAFS is expected to fund short term projects with immediate impact. The Program is likely to support applied sciences that will be disseminated immediately through education and extension. Many projects are expected to be functionally integrated, that is to propose research, education, and extension in one project.

Eligibility for the two programs differs slightly. The NRI is open to all qualified scientists, regardless of the type of institutions or organization from which they reside. With its broad eligibility, the NRI supports all colleges and universities, Federal agencies, other research institutions and organizations, private organizations and corporations, and individuals. IFAFS is more narrowly defined in its eligibility which includes all colleges and universities, Federal laboratories including National labs, and private research organizations with a demonstrated capacity for research.

Mr. Skeen. What would be the impact if the requested funding increase were not provided?

Response. The impact of not obtaining funds would include long-term negative consequences to the U.S. economy, and specifically U.S. agriculture's competitiveness in the world market. Severe consequences for international trade, food safety, and environmental protection would result. As other countries throughout the world continue to increase investments in agricultural research, the U.S. must also do so as well to maintain its economic advantage in the world of agriculture. However, because these are long-term investments, the impacts of not funding the program may not be recognized immediately and could be easily underestimated. Thus, investment in the NRI is an investment in the future of U.S. agriculture.

The NRI holds a distinctive place in USDA's overall research portfolio as a consequence of its emphasis on foundational knowledge and its openness to all qualified scientists. Its role to the agriculture, food, and environment sector can be compared to the role that the National Institutes of Health's--NIH--extramural research program plays in relation to the biomedical and health sector. The effect of under funding the NIH, however, would also not be evident right away. For example, a noticeable slowing of important advances and solutions for biomedical and health problems would not immediately be observed. Yet, it would not be prudent to provide increased funding only after noticeable negative consequences ensue. Similar logic is valid for the NRI's funding.

Protecting the security of the U.S. food and fiber supply, as well as the competitiveness of the U.S. agricultural sector, are vital. Yet, U.S. agriculture has fallen behind other sectors in addressing what is required to remain competitive

in the coming century. The NRI, through its competitive peer review system, is a proven funding mechanism that helps agriculture maintain its global competitiveness. Other federal agencies with strong records in meeting national needs, such as the NIH and the National Science Foundation--NSF--, allocate more than 80 percent of research dollars to competitive grants. In contrast, the USDA contributes only about 10 percent of its research expenditures to competitive grants.

If the small number and size of awards continues, the NRI will fail to attract the necessary talent from the Nation's best scientists to address agriculture's highest priorities. Evidence that this is occurring is already present. Submissions to the NRI have been declining as its funding levels have been decreasing. The knowledge base needed to solve agricultural problems will continue to diminish and the foundation to provide solutions will be further eroded. The U.S. will be less prepared to respond effectively to new and re-emerging agricultural crises effecting crops, forests, animals, and the environment. Major advances in agricultural genomics will be delayed and more opportunities to strengthen the agricultural sector in other areas will be lost. An increasing number of non-U.S. scientists and foreign competitors will gain a competitive edge with intellectual property and patent rights. To maintain the U.S. as the worldwide agricultural leader, and the role of U.S. scientists as the premier leaders in agricultural research, funding increases are paramount.

The NRI also risks becoming marginalized by other Federal agencies if it is not able to provide meaningful support for collaborative partnerships. In other words, if the funding for the NRI remains level, the program stands to lose its impact on the direction of research in this country as other Federal programs grow and become an even greater percentage of the total Federal research and development porfolio. Additionally, the ability to foster and stimulate sufficient multidisciplinary research teams that work on agricultural problems will continue to be compromised unless funds are available to permit larger award sizes. The ramifications of all of these consequences would seriously jeopardize the health and well-being of the U.S. economy.

INTEGRATED RESEARCH, EDUCATION, AND EXTENSION ACTIVITIES

Mr. Skeen. Section 406 of the Agricultural Research, Extension and Education Reform Act of 1998 enables an integrated approach to research, education and extension activities. The fiscal year 2000 appropriation provided $39.5 million for integrated activities, the budget requests an increase of approximately $36.6 million for current and new activities. For comparability purposes, please provide a table that shows the fiscal year 1998 through 2001 funding for these categories.

(The information follows.)

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE
FISCAL YEARS 1999, 2000 AND 2001 FUNDING FOR INTEGRATED ACTIVITIES
(Dollars in Thousands)

Integrated Authority	FY 1998 Appropriation	FY 1999 Appropriation	FY 2000 Appropriation	FY 2001 President's Budget
Small Farms Initiative	- -	- -	- -	4,000
Water Quality	11,522 a/	13,022 a/	13,000	16,204
Food Safety	4,365 a/	12,365 a/	15,000	15,000
Pesticide Impact Assess. Program	4,541 a/	4,541 a/	4,541	4,640
Crops at Risk from FQPA Implementation	- -	- -	1,000	3,000
FQPA Risk Mitigation Program for Major Food Crop Systems	- -	- -	4,000	10,000
Methyl Bromide Transition Program	- -	- -	2,000	5,000
Anti-Hunger and Food Security	- -	- -	- -	5,250
International Science and Education Grants	- -	- -	- -	1,000
Biobased Products Program	- -	- -	- -	9,600
Invasive Species	- -	- -	- -	1,500
Organic Transition Program	- -	- -	- -	1,000
Total, Integrated Activities	20,428	29,928	39,541	76,194

a/ These programs were funded as Special Research Grants in fiscal years 1998 and 1999.

INTEGRATED RESEARCH, EDUCATION, AND EXTENSION ACTIVITIES

Mr. Skeen. Please explain how the integrated approach more effectively uses the funds for the various categories rather than other methods, using specific examples.

Response. CSREES was created by merging the Cooperative State Research Service and the Extension Service in 1995. Since that time, CSREES has integrated the staff, functions, and goals of the two former agencies into a new agency to serve the American public with the highest quality agriculture and food system research, education and extension programs. However, this integration could never be complete while no funding mechanism existed to link the functions of research, education and extension together under a single program. The Agricultural Research, Education and Extension Reform Act of 1998 includes Section 406, Integrated Activities, giving CSREES the authority to develop programs which integrate these three functional areas. In fiscal year 2000, Congress appropriated $39.541 million under this funding authority.

Funding research, education, and extension under the Integrated Activities authority holds several advantages. The integrated program is open to a broader array of colleges and universities. All colleges and universities, including the

1890 Institutions, Hispanic Serving Institutions, and non-land grant colleges of agriculture are eligible to compete for funds under these programs, thereby broadening the range of topics proposed and building research, extension, and education capacity of the non-1862 Land Grant community. Grants from the integrated authority programs are competitively awarded, as required by law; therefore, all proposals will be judged on technical merit, with only the best programs funded. Most importantly, the integrated program more closely links research programs with extension and education activities and transfers the results of the research to producers more quickly. For instance, in the pest management area, several programs are funded under integrated authorities: Pesticide Impact Assessment, Crops at Risk from FQPA Implementation, FQPA Risk Mitigation and Methyl Bromide Transitions. These programs address critical issues faced by producers who stand to lose important pest control tools to the implementation of FQPA. The research to develop new pest management systems must be immediately transferred to producers. The most effective way to promote this linkage is through a single integrated competitive program which evaluates each project on the basis of scientific merit and the linkage of research, extension, and education components.

BIOBASED PRODUCTS

Mr. Skeen. For the record, please explain in some detail the needs for biobased integrated activities requested in the fiscal year 2001 budget proposal.

Response. The proposed program targets the expansion of the domestic industrial base through research and development of agricultural raw materials as feedstocks for industrial products. Thus far, advances in agriculture have stressed crop production technologies without a comparable interest in new crops or conversion technologies to produce industrial products. Promoting research and development in biobased products is timely because successful outcomes include new and expanded markets, added value from utilization of agricultural wastes, crop diversification, fostering of sustainable development since biobased products are renewable, and environmentally-friendly products and processes that will ultimately stimulate further relevant research and development. The integration of research, education, and extension activities is an efficient strategy to accomplish these outcomes.

Mr. Skeen. How would the funding be used? Who would likely receive the funding?

Response. This funding will complement ongoing efforts by focusing on consortia that can efficiently address technical and economic roadblocks for biobased products. The funding would be targeted for two major categories. The first category is new products from alternative crops, which are defined as new or non-traditional commodities from agriculture and forestry not currently widely cultivated. The second category is new uses/value added products which are defined as new nonfood uses from traditional crops, forestry resources, waste from agricultural activities or agricultural processing waste steams.

As required by legislation, funding recipients would be colleges and universities that successfully integrate research, education, and extension activities. It is anticipated that consortia would include appropriate entities with the Department of Defense--DoD--to conduct test/evaluation and demonstration/validation of biobased products of interest to the military and would dovetail with ongoing DoD demonstration/validation programs.

EXTENSION INDIAN RESERVATION PROGRAM

Mr. Skeen. Please describe the Extension Indian Reservation Program for the Committee and explain why a program level of $5 million is needed in fiscal year 2001.

Response. The Extension Indian Reservation Program--EIRP--provides Extension agents and links the Land Grant University. The EIRP is designed for large reservations--100,000 acres or larger--that preclude adequate programming from existing county staffs. Reservations are isolated, seldom have industrial development or job opportunities, and often have high rates of unemployment, alcoholism, school-dropouts, and nutrition-related health problems. Gainful employment opportunities are tied to the limited natural resource base--mostly land and water. Agriculture is often the only feasible route to gainful employment. This program helps reservation residents to make the most of their cultural and natural resources in the production of crops and livestock; in the development of youth skills, self esteem, and educational achievement; in the maintenance of family health and well-being; and in the achievement of an improved quality of life.

The Reservation Extension agents help Native Americans to produce and market crops, livestock, and timber; to develop quality products to overcome isolated sales locations and quality or shipping discounts; to develop and exploit niche markets; to develop healthier life styles; to develop more nutritious diets; to forestall diabetes--a ubiquitous malady in Indians--; to develop marketable life-skills; to stay in school until graduation; to pursue higher education; and to help themselves. There is widespread need for more of these programs that assist new and experienced farmers and ranchers; that provide linkages for "Remote Area"--veterinary--Medicine programs on the reservations; and that encourage youth to achieve, develop leadership skills, stay in school, develop healthy life styles, and to pursue college educations that will be helpful to their families and others.

Developing these skills will enable reservation residents to make direct use of their natural and cultural resources, rather than leasing them to outsiders and depending upon the Bureau of India Affairs--BIA--to collect, mishandle, and distribute the receipts; or to depend upon welfare programs for sustenance.

There is a need for about 85 such projects, based on reservation numbers and size. To date, only 25 are in operation because there has been no funding increase for this program since 1990. There is a backlog of 17 applications for this program. Other reservations have expressed interest, but have been discouraged from submitting applications until additional funding is available. The proposed increase to $5 million would allow the program to increase the level of support for many of the existing projects, and to add an additional 23 Reservation agents.

Mr. Skeen. How many reservations are impacted by this program currently and under the fiscal year 2001 budget proposal?

Response. The present level of funding--$1.71 million--, supports EIRP agents--employees of the State Land-Grant University--on 25 reservations, distributed as follows:

Alaska-------1 (Tanana Chiefs Conf)
Arizona -----4-(Navajo [Window Rock], Hopi, San Carlos Apache, Colorado River Tribes.)
Florida ------1 (Seminole)
Idaho---------1 (Fort Hall)
Mississippi--1 (Choctaw)
Montana------4 (Flathead, Northern Cheyenne, Blackfeet, Ft. Belknap)
N. Carolina--1 (Cherokee)
N. Dakota----1 (Fort Berthold)
New Mexico---3 (Jicarilla Apache, Zuni, Navajo [Shiprock]*)
Nevada-------1 (Nevada tribes)
Oklahoma-----1 (Muscogee)
Oregon-------1 (Warm Springs)
S. Dakota----2 (Pine Ridge, Rosebud)
Washington---2 (Chehalis, Colville)
Wyoming------1 (Wind River)

*Administered by the University of Arizona, in cooperation with New Mexico State University and the Utah State University.

Under the fiscal year 2001 proposal, the program would actively solicit applications for new projects from those reservations that have previously applied, and from all other qualified reservations. The Inter Tribal Agriculture Council estimates that a total of 86 agents are needed to adequately serve such reservations. The proposed increase would allow the EIRP to expand to a total of 48 reservation agents.

FARM SAFETY

Mr. Skeen. How does the new Youth Farm Safety Education and Certification program with a proposed funding level of $5 million differ from the Farm Safety program that is proposed at zero funding in fiscal year 2001?

Response. The Youth Farm Safety Education and Certification program focuses on providing formal training and certification to youth age 16-17 years. This competitive grants program responds to proposals that would remove the exemption for certified 14-15 year olds employed on farms not owned or operated by their legal guardian in hazardous agricultural occupations and require certificates of training for 16-17 year olds.

Mr. Skeen. Please explain the differences in the two programs. What statistical data was used to support the budget proposals as they relate to need?

Response. The primary difference is the Youth Farm Safety Education and Certification program supports specific formal training that is required by the Fair Labor Standards Act while the current Farm Safety program provides limited support for an Extension program developed by State or Territory Extension specialists that addresses a wide range of farm safety program needs identified by these specialists.

The budget for the Youth Farm Safety Education and Certification program is based on estimated costs provided by State Extension specialists and educators that are currently conducting this training for 14-15 year olds as required by the Fair Labor Standards Act, and the anticipated increased demand for training of 16-17 year olds should the Act be amended to change age requirements for this training. Data on the number of 16-17 year old youth working as hired farm workers is sparse. The General Accounting Office's review of the data concluded that incomplete data may underestimate the number of children working in agriculture. An estimate of 80,000 16-17 year old workers is based on data reported from the Current Population Survey and the National Agricultural Worker Survey. No Federal funds have been appropriated to support the current certification training required by the Fair Labor Standards Act for 14-15 year olds. Thus, State Extension programs have struggled to find the resources to provide the training, keep training materials current, and conduct evaluations of the training.

STREAMLINED MANAGEMENT AND ACCOUNTABILITY

Mr. Skeen. In Dr. Laughlin's witness statement, he mentioned streamlined management and improved accountability as one of seven overarching themes in the fiscal year 2001 CSREES budget. Please elaborate, in some detail, on how, where, and when this theme would be seen in CSREES.

Response. The fiscal year 2001 budget supports improved accountability through a requested increase for the Research, Education, and Economics Information System--REEIS. REEIS will provide highly relevant quality data to enable the Department and its partners to conduct project and program evaluations and assessments; perform comprehensive baseline and time-series analysis; improve accuracy and reliability for program planning, budgeting, and coordination; and assess the impact of research, extension, and other activities, especially with the Government Performance and Results Act--GPRA--goals and objectives. REEIS is increasingly needed to satisfy accountability reporting by the GPRA, and in particular to meet requirements related to performance assessment and evaluation of agricultural research, extension, and education programs; accountability to Congress, commodity groups, and USDA management; acquisition and dissemination of impact information; strategic planning; and reallocation of portfolios due to new and emerging high priority topics.

The FY 2001 budget supports the CSREES commitment to streamline management and delivery of programs by integrating research, education, and extension programs, where appropriate, as authorized by Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998--AREEA. This integrated grant authority allows the agency to support programs that solve problems through multifunction research, extension, and education activities without the distinction resulting from separate legislative authorities for research and extension. This approach promotes a stronger linkage between research, extension, and education to ensure that the knowledge and technology generated by research is delivered to the end-users, including producers, consumers, communities, and students.

The FY 2001 budget also targets high priority research, education, and extension programs to meet the shared goals of the Federal/State partnership. These priorities include programs that expand outreach to minority-serving institutions and help producers meet requirements under the Food Quality Protection Act.

CSREES is increasing accountability and streamlining management activities through implementation of AREERA. Examples of this are implementation of Sections

202 and 205 of AREERA which requires that 1862 and 1890 Institutions prepare, submit, and have approved, as a condition of receipt of Federal research and extension formula funds, a Plan of Work --POW-- for funds authorized under the Hatch Act, Smith-Lever 3 b&c, Section 1444 --formula program for 1890's extension-- and Section 1445 --formula program for 1890's research. Working with our land-grant university partners, CSREES developed guidelines for implementation of these provisions, and universities submitted five-year Plans of Work which were reviewed and approved prior to the distribution of FY 2000 formula funds. Included in the Plans of Work is information on the merit and peer review process used by the land-grant universities in their allocation of formula funds. This POW requirement implements Sections 103(e), 104(h), and 105(i) of AREERA.

STREAMLINED MANAGEMENT AND ACCOUNTABILITY

RESEARCH, EDUCATION, AND ECONOMICS INFORMATION SYSTEM

Mr. Skeen. Please describe the Research, Education, and Economics Information System for the Committee. We are interested in knowing more about the costs, uses and benefits of the system.

Response. The purpose of Research, Education, and Economics Information Systems--REEIS--is to provide a "one-stop" shop for information on the activities of the Research, Education, and Extension--REE--mission agencies--research, extension, education, and statistics --currently scattered, and often buried, in multiple databases through a unified user interface. The system is intended to address the general and specific information needs of a broad range of users, from administrative and congressional decision makers to the public-at-large.

The costs of REEIS to date have been incurred in (1) identifying and describing the source databases--about 40--containing the most relevant information, (2) conducting a comprehensive needs assessment study which produced a high level requirements statement, (3) completing an information systems technology review identifying state-of-the-art technologies that can be utilized by REEIS, (4) developing a data model that presents a coherent picture of the wide-ranging needs of users for information, and (5) creating a prototype that illustrates the kind of questions that can be posed to REEIS and the answers it can provide. Future costs will be entailed in (1) migrating, or linking to, data in source systems for REEIS, (2) refining the user interface for different categories of users to satisfy their specific needs, and (3) staffing and operating the fully implemented system. To date, $2.2 million has been expended; future expenditures over the remainder of the fiscal year and next are expected to be $3.9 million.

Uses of REEIS will vary by broad categories of users--approximately 25 different categories have already been identified--including congressional staff, administrators, national program leaders, university administrators and faculty, extension personnel, educators, and the general public. Those with fiscal responsibilities will be able to readily answer questions pertaining to the costs of REE mission activities according to a broad range of parameters such as topic, geographic area, institution, national initiative, program areas, fiscal year, commodity or resource, and strategic goal. The general public will be given one central location for gaining access to information and to subject specialists to answer their broad and specific needs for information pertinent to their agricultural interests.

Each category of potential REEIS user will benefit greatly. Administrators and congressional staff will be able to get ready answers to specific kinds of

questions, such as how much is being spent on commodity or program by state, congressional district or institution, that in the past would involve interaction with intermediaries and more time. One of the primary benefits will be the ability to aggregate and disaggregate data--the most frequently cited requirement in the needs assessment study--in seconds and minutes instead of hours and days. Results of research, education, and extension activities by outcomes and strategic goals will also be more readily accessible. The general public will be able to access a rich body of pre-screened information on their agricultural interests instead of having to sift through the much larger body of information generally available on the World Wide Web.

EXTENSION AGENTS

Mr. Skeen. How many Extension agents are currently located at the State and county levels? Have there been any significant changes in number or use of extension agents in the last 12 months? What are your plans for fiscal year 2000 and 2001?

Response. There are approximately 9,500 County Agent positions within a total of 17,000 Extension personnel. Aside from including agent positions, the total also includes specialists and support staff. There have been no significant changes in the number or use of extension agents this year, and we do not anticipate any changes in fiscal years 2000 and 2001.

PESTICIDE IMPACT ASSESSMENT

Mr. Skeen. How much of the pesticide impact assessment funding is awarded competitively, and how much is distributed on a formula basis?

Response. In fiscal year 1999, $3 million were allocated on a formula basis to the states/territories to provide partial support for their participation in the National Pesticide Impact Assessment program--PIA. PIA also provided $300,000 to each of the four regions, for a total of $1.2 million, for regional competitive grants programs to develop pest management information for use by Federal and state agencies. These data are shared with USDA's Office of Pest Management Policy and the U. S. Environmental Protection Agency to help them make better informed regulatory decisions related to the Food Quality Protection Act. In fiscal year 2000, PIA was moved to the Integrated Activities Program, Section 406 of the Agriculture Research, Education and Economics Reform Act. All funds will be distributed to colleges and universities through grants on a competitive basis. The request for multi-state, multi-disciplinary proposals will be developed to reflect Federal and regional pest management needs and priorities.

AGRABILITY

Mr. Skeen. How many requests for AgrAbility projects did you receive and how many did you fund in fiscal year 1999? How many requests have you received to date this fiscal year? Provide a list of funded projects in 1999 and 2000 and the funding for each.

Response. In fiscal year 1999, we did not request proposals for new AgrAbility projects. We received requests for funding from the 18 State projects and one National project eligible for continuation funding, and all of these

projects were funded in fiscal year 1999. We did not request proposals for new State projects in fiscal year 2000. We received requests for funding from the 18 State projects eligible for continuation funding. Funds have not yet been released for these projects. We did request proposals for a new National AgrAbility project in fiscal year 2000. The closing date for submitting proposals is May 15, 2000. The continuation projects funded in 1999 are:

State	Project Title	1999 Funding
Colorado	New Colorado AgrAbility Project	$95,500
Delaware	Delmarva AgrAbility Project Initiative	$95,500
Illinois	Illinois AgrAbility Unlimited Program	$95,500
Indiana	AgrAbility Program	$95,500
Indiana	USDA-CSREES National AgrAbility Project	$253,800
Iowa	Iowa AgrAbility: Innovations That Work for Home and Farm	$95,500
Kentucky	Kentucky AgrAbility Project	$95,500
Minnesota	Minnesota AgrAbility Project	$95,500
Mississippi	Mississippi AgrAbility Project	$95,500
Missouri	Missouri AgrAbility Project	$95,500
Nebraska	Nebraska AgrAbility	$95,500
North Carolina	North Carolina Farmworkers AgrAbility Project	$95,500
North Dakota	AgrAbility in Dakota	$95,500
Pennsylvania	AgrAbility for Pennsylvanians	$95,500
South Dakota	South Dakota AgrAbility Project	$95,000
Tennessee	Tennessee AgrAbility Project	$95,500
Texas	Texas Farmers & Ranchers with Disabilities Identification & Accommodation Network	$95,500
Utah	Utah AgrAbility Program	$95,500
Wisconsin	AgrAbility of Wisconsin	$95,500
	TOTAL	$1,972,800

SUSTAINABLE AGRICULTURE RESEARCH AND EDUCATION PROGRAM

Mr. Skeen. How many sustainable agriculture projects were funded through the Sustainable Agriculture Research and Education program in fiscal year 1999? How many are planned for fiscal year 2000? What was the average cost per project in fiscal year 1999?

Response. In fiscal year 1999, the SARE program funded 217 projects. The average cost per project was $90,278 per project for the 56 Research and Education grants, and $4,602 per project for the 161 Producer Grants. In fiscal year 2000, the number of projects funded will be based on the quality of proposals submitted. Proposals are subject to merit reviews and ranked for funding. Only the highest quality proposals are funded.

YOUTH AT RISK PROGRAM

Mr. Skeen. How many programs were funded under the Youth-at-Risk program in fiscal year 1999, and how many are proposed to be funded in 2000? What is the average cost per project?

Response. In fiscal year 1999, 46 projects were funded under the Children, Youth, and Families At Risk Program. Average cost per project was $149,884. Thirty-nine of the 46 projects funded were renewals of projects awarded competitively in fiscal years 1995 - 1998.

In fiscal year 2000, it is projected that 43 projects will be funded under the Children Youth, and Families At Risk Program. Average cost per project is estimated at $152,442.

Mr. Skeen. Please update the table that appears on page 1781 of last year's hearing record showing the funding levels for each of the Centers that support programs for at-risk youth and families to include fiscal years 1998 and 1999.

Response. The following table indicates the funding levels for each Center or Network:

CHILDREN, YOUTH AND FAMILY NETWORK FUNDED BY CSREES

Network	Federal 1998	Non-Federal	Federal 1999	Non-Federal	Partner Universities	Fiscal Manager
Child Care	$160,000	$48,000	$77,635	$23,396	16	Kansas State University
Science & Technology	$160,000	$48,000	*	*	13	Michigan State University
Family Resiliency	$160,000	$48,000	*	*	42	Iowa State University
Health	$160,000	$48,000	$296,250	$61,562	28	North Carolina State University
Collaboration	$160,000	$48,000	*	*	21	Ohio State University
CYFERNet-Program			$225,500	$56,375	11	University of Kentucky
CYFERNet-Evaluation			$235,000	$58,750	5	University of Arizona
CYFERNet-Technology			$297,750	$74,438	6	University of Minnesota

* Five-year funding cycle ended in fiscal year 1998.

EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM

Mr. Skeen. Please explain the need for the $2,348,000 increase in the Expanded Food and Nutrition Education Program.

Response. Hunger, unemployment and under-employment, and poor health are realities in far too many communities across the United States. A comprehensive nutrition education program, that incorporates the skills needed to select and prepare more nutritious diets and thus reduce the incidence of chronic disease, combined with food safety education to reduce the incidence of food borne illness and education on food resource management to help low income families stretch their food dollar and reduce their reliance on emergency food assistance, can help to achieve a thriving community. The Expanded Food and Nutrition Education Program or EFNEP, addresses these three areas.

Through an experiential education program conducted by the Cooperative Extension System in all 50 States and 6 U.S. Territories, EFNEP uses paraprofessionals hired from the low income population to teach nutrition education, food safety, and food resource management skills to low income families with young children and low income youth. A comprehensive evaluation system captures data on the program impact, showing that 92 percent of adult participants had a positive change in their diets, 87 percent showed improvement in nutrition practices, 83 percent improved food resource management practices, including 42 percent who less often ran out of food before the end of the month, and 65 percent improved food safety practices.

A study conducted by the University of Tennessee calculated that for every $1 spent to implement EFNEP, families saved $2.48 in reduced food expenditures, which can then reduce the need to access emergency food assistance programs.

The increased funding will allow more families and communities to be reached, thus saving future health care and food assistance funds.

Mr. Skeen. What percent of the total EFNEP funds are devoted to families on food stamps, the WIC program, or other Federal food assistance programs? Does this change much form year to year?

Response. In fiscal year 1999, 20 percent of the adult EFNEP participants were enrolled in EFNEP alone--no public or food assistance programs--at the time they entered the program. Seventy-six percent of the families were enrolled in one or more food assistance programs at the time of enrollment; 44 percent were enrolled in Food Stamps; 51 percent were enrolled in the WIC program; 26 percent were enrolled in the National Child Nutrition Program, 4 percemt in The Emergency Food Assistance Program; and 1 percent in the Food Distribution Program on Indian Reservations. EFNEP helped an additional 9 percent of families to enroll in one or more programs for which they were eligible.

The number of food stamp participants reached through EFNEP has declined slightly in the past few years. This may be a reflection of the overall decline in food stamp enrollment nationwide and/or the increase of other programs specifically targeting Food Stamp recipients.

RURAL DEVELOPMENT CENTERS

Mr. Skeen. Please update the table that appears on page 1785 of last years' hearing record, indicating how each of the Rural Development Centers allocated their funds by category and in total, to include fiscal year 2000.

Response. Center expenditures by category for fiscal year 2000 are as follows:

	Northeast	Southern	North Central	Western
Personnel	$126,536	$ 166,880	$193,295	$153,817
Travel	51,389	25,000	36,748	22,059
Publications	11,000	6,000	5,500	1,200
Current Expenses	14,001	39,000	11,502	3,800
Subcontracts	52,954	25,000	8,835	75,004

Mr. Skeen. Also provide a table that shows the amount of non-Federal funding available to the Centers since fiscal year 1991.

Response. The non-Federal amounts are as follows:

Fiscal Year	Northeast	Southern	North Central	Western
1991	$ 48,860	$332,000	$ 584,538	$ 114,802
1992	51,384	229,000	482,292	37,698
1993	148,070	297,000	384,414	38,000
1994	139,000	221,000	595,514	1,247,241
1995	15,000	183,000	880,083	1,284,939
1996	84,000	273,000	3,104,662	98,000
1997	55,000	164,752	1,086,485	16,000
1998	12,900	350,000	1,075,043	122,105
1999	25,900	350,000	990,244	106,105
2000	40,788	375,000	712,640	172,562

4-H ENROLLMENT

Mr. Skeen. Please provide a ten year table that shows both rural and urban 4-H enrollment including fiscal year 2000 estimates.

(The information follows.)

4-H YOUTH ENROLLMENT - FISCAL YEARS 1991 - 2000

2000 (est.)	700,000	2,110,000	45	1,500,000	600,000	1,610,000	55	6,520,000
1999	695,371	2,107,282	44	1,477,739	592,445	1,608,964	56	6,481,801
1998	736,310	2,129,866	44	1,344,466	573,219	1,607,609	56	6,391,470
1997	701,734	2,113,992	46	1,344,466	584,501	1,254,012	54	5,998,705
1996	710,824	1,989,951	47	1,243,497	606,767	1,137,422	53	5,688,461
1995	652,510	1,917,559	48	1,142,561	598,909	1,082,430	52	5,393,969
1994	719,040	2,056,144	50	1,187,614	568,815	1,068,474	50	5,600,087
1993	681,811	1,964,008	48	1,115,524	572,816	1,144,667	52	5,478,826
1992	684,239	1,987,150	47	1,127,113	650,918	1,194,965	53	5,644,385
1991	695,482	2,068,170	49	1,073,863	587,678	1,232,464	51	5,657,657

MULTICULTURAL SCHOLARS PROGRAM

Mr. Skeen. The Multicultural Scholars Program was established in fiscal year 1994. Provide a table that shows, by fiscal year, the amount of Federal and non-Federal funding provided, the number of scholarships awarded, and the number of resulting graduates, including fiscal year 2000 estimates.

Response. The first Multicultural Scholars Program awards were made in fiscal year 1995. Fiscal year 1994 funds were combined with those from 1995, and awarded in fiscal year 1995. To date, all awards have been made in odd-numbered years. This schedule reduces peer paneling costs and makes a larger pool of grant funds available to a larger number of institutions.

The program requires a 25 percent non-Federal matching requirement. Some institutions exceed the required amount. A Multicultural Scholars Program summary table follows.

MULTICULTURAL SCHOLARS PROGRAM

Fiscal Year	Federal Funding*	Non-Federal Funds**	Scholarships Awarded+	Resulting Graduates++
1994	$ -0-	$ -0-	--	--
1995	$ 1,924,160	$ 481,040	102	--
1996	$ - 0-	$ -0-	--	--
1997	$ 1,920,000	$ 480,000	104	3
1998	$ -0-	$ -0-	--	37
1999	$ 1,899,964	$ 474,991	103	72
2000	$ -0-	$ -0-	--	12
2001	$ 2,880,000	$ 720,000	152	92

* Awards are made in odd-numbered years, e.g., fiscal year 1994 and 1995 funds were combined and awarded in fiscal year 1995.

** Requires a 25 percent non-Federal match.

\+ Due to award timing and the institution's recruiting period, some scholars may not enroll until the start of the following academic year.

++ Award is for a five-year period. Scholars appointed in any year may be freshmen, sophomores, or juniors; therefore, not all scholars graduate within four years of award. Graduate numbers for fiscal years 1999-2001 are projected.

AID-PASA

INTERNATIONAL PROGRAMS

Mr. Skeen. Describe the work you are doing for AID-PASA this fiscal year.

Response. CSREES designs, implements, and evaluates technical assistance projects overseas. Current activities include projects funded by the US Agency for

International Development--USAID--in Armenia, South Africa, and Central America. Following is a brief description of each of these programs, along with examples of a few smaller initiatives that we are carrying out with funding from USAID.

In Armenia, we are working with the Armenian Ministry of Food and Agriculture and newly privatized farmers to enhance production, processing, and marketing capabilities. We are managing an agriculture market assistance project to help private entrepreneurs market high-value horticultural products. At the same time, we are utilizing the expertise of staff from U.S. colleges and universities to develop the Armenian Extension Service's ability to meet the needs of clientele at the local level. In collaboration with Texas A&M University, we are also assisting the Armenian Agricultural Academy to improve its applied research, marketing, and outreach curriculum.

As part of the U.S.-South Africa Binational Commission's mandate, we have just recently launched important work in South Africa with funds from USAID. In cooperation with colleagues from the University of Arkansas - Pine Bluff and from other campuses, we are working with traditionally under-served small-holder women farmers in South Africa as they strive to strengthen their food processing and local marketing skills.

With support from USAID, we are responding to the need for technical assistance in Honduras, Guatemala, and Nicaragua as those countries continue to recover from the devastation caused by Hurricane Mitch. We have targeted improvements in food safety and land management as key recovery elements, and are drawing upon the advice of colleagues from Cornell University, North Carolina A&T University, Purdue University, and others to help with this important work.

In addition to these major project initiatives, we have four university personnel under Resources Support Services Agreements with USAID. One from Texas A&M University is working in USAID's Global Bureau as a micro-finance advisor; another from Auburn University is fostering collaboration between non-governmental organizations and U.S. universities in USAID's Office of Private and Voluntary Cooperation; the third person, from Utah State University, works with USAID on strengthening local non-governmental organizations involved in rangeland tenure and other agricultural issues; and the fourth person, from Washington State University, works with USAID's Bureau for Africa as a research associate providing leadership and overall direction for the Knowledge Exchange and Learning Partnerships initiative.

University personnel who participate in these activities return to their universities with increased capacity to assist university students and other clientele to prosper in a global economy.

PESTICIDE IMPACT ASSESSMENT PROGRAM

Mr. Skeen. Provide a table that shows, by agency, the amount contributed to the National Agricultural Pesticide Impact Assessment Program for fiscal years 1999, and estimates for 2000 and 2001.

Response. The Pesticide Impact Assessment Program--PIA-was funded in fiscal year 1999 as follows: Special Research Grants $1.327 million, Smith-Lever 3(d) funds $3.214 million, which totals $4.541 million. In fiscal year 2000, PIA was moved to the Integrated Activities category of the CSREES budget and is level funded at

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$4.541 million. In fiscal year 2001, the CSREES budget request for PIA in the Integrated Activities Program is $4.640 million.

1890 LAND-GRANT FACILITIES PROGRAM

Mr. Skeen. The 1990 farm bill authorized a $40 million, five-year facilities program for the 1890 land-grant colleges and Tuskegee University. Funding began in fiscal year 1993 and was scheduled to end in fiscal year 1997. Your budget justification proposes $12,000,000 for this program in 2000 and 2001. Please provide a summary by institution of the progress reports submitted for each facility project in fiscal year 1999 and plans for 2000.

Response. The following is a chart which provides the progress to date on each of these projects, as well as the plans for each facility in fiscal year 2000:

1890 FACILITIES PROGRAM

SUMMARY OF PROGRESS

Fiscal Years 1999 and 2000

Institution	1999	2000
Alabama A&M University Normal, Alabama	-Develop specifications and bid requests for connectivity of Interactive Video Center and Mobile Video Conference Laboratory - Select architect for renovation of teaching and research laboratories - Select architect for replacement of heating and cooling system for Hobson Bonner Halls - Purchase research equipment - Enhance Extension facilities/equipment	- Enhance teaching facilities for academic units in family, consumer and food sciences - Establish a multi-media laboratory to enhance instruction and research lecture, workshops and seminars - Initiate the bid process to replace the laboratory and field research equipment - Convert extension laboratories in accommodations for new program efforts

Institution	1999	2000
Tuskegee University Tuskegee, Alabama	- Renovate and upgrade Milbank Hall - Renovate and upgrade the Vocational Building as an Extension Activity Center - Upgrade gutters and repair Morrison-Mayberry Hall - Planning for improving and constructing teaching facilities - Renovate the Vocational Education Building - Construct Safety and Food Processing Center - Purchase equipment for the Extension Building	- Complete the renovation of Milbank Hall - Renovate and convert the Vocation Building as an Extension Activity Center - Plan for teaching facilities - Install and seal flooring in Milbank Hall - Install draining system in Milbank Hall - Replace roof of the new wing of the Carver Research Foundation Laboratory - Acquire land and plan for rural tourism and business development laboratory - Construct Safety and Food Processing Center
University of Arkansas Pine Bluff, Arkansas	- Site improvements at the University of Arkansas at Pine Bluff (UAPB) farm - Support renovation of Woodard Hall - Renovation of Child Development Laboratory - Renovate Agronomy storage building - Acquire replacement farm vehicles - Purchase GIS survey system equipment - Purchase instructional and audio-visual equipment - Design of the Sheep Facility - Construction of Fish Processing and Marketing Facility	- Design for renovation of Woodard Hall - Upgrade playground at the Child Development Center - Design of the Child Development Center - Renovation of Agronomy Storage Building - Construct an outdoor pavilion at the Lonoke farm site - Purchase instructional, farm and research equipment
Delaware State University Dover, Delaware	- Plan and construct a facility for office, laboratory and classroom space - Construction of the herbarium	- Construct an office, laboratory and classroom building to support the research, extension and academic programs and centralize the location of two academic departments of the School of Agriculture, Natural Resources, Family and Consumer Sciences. - Complete construction of the herbarium

Institution	1999	2000
Florida A&M University Tallahassee, Florida	- Acquire land to construct a facility for research, teaching and extension aquaculture - Develop plans and specifications for Aquaculture facility	- Determine equipment and supplies needed for the Aquaculture facility and laboratories - Develop plans and specifications for multi-purpose research, teaching and extension facility - Purchase computer and office equipment for extension offices - Acquire materials and supplies to develop outreach Environment Science programs - Acquire equipment and furniture for distance learning classrooms - Develop plans and specifications for enclosure at teleconference center
Fort Valley State University Fort Valley, Georgia	- Plan for the construction of the Family Development Center - Acquire and improve laboratory and demonstration equipment	- Construction of the Family Development Center - Acquisition and installation of laboratory and demonstration equipment
Kentucky State University Frankfort, Kentucky	- Development of a Research, Extension and Teaching Aquaculture Field Station - Establishment of Resource Technology Center	- Establishment of a Resource Technology Center

Institution	1999	2000
Southern University and A&M College Baton Rouge, Louisiana	- Purchase and install equipment including animal pens, electronic timers, portable bleachers, portable panels, poultry coops - Purchase a small vehicle - Purchase fire and sound evacuation, security and monitoring systems for the Multi-purpose Livestock Show Arena - Renovate the facility (Pinkie Thrift Hall) for the Division of Family and Consumer Sciences - Bring the Meat Processing Laboratory to meet health department standards - Plan to construct a facility to store agricultural chemicals - Construct the Cooperative Extension Administrative Complex and Center for Small Farms Research and the Arena Complex	- Renovate meat laboratory - Install video equipment for conference center - Renovate the facility (Pinkie Thrift Hall) for the Division of Family and Consumer Sciences - Renovate the Meat Processing Laboratory to meet health department standards - Complete purchases and installation of signage, equipment and furnishings for the Cooperative Extension Administrative Complex and Center for Small Farms Research and the Arena Complex - Complete landscape design, and design and construction of parking lot for the Cooperative Extension Complex
University of Maryland Eastern Shore Princess Anne, Maryland	- Design of the Plant Science and Teaching Research Facility - Design of the Food Science and Technology Center	- Construction of the Plant Science and Teaching Research Facility - Construction of the Food Science and Technology Center - Purchase equipment for the Cooperative Extension facility
Alcorn State University Lorman, MS	- Planning of Center for Biotechnology - Planning of Center for Environmental Ecology and Natural Resources	- Construction of Center for Biotechnology - Planning of Center for Environmental Ecology and Natural Resources - Computer Networking
Lincoln University Jefferson City, MO	- Renovation of Bennett Hall	- Continue renovation of Bennett Hall

Institution	1999	2000
North Carolina A&T State University Greensboro, NC	- Wire and connect offices and classrooms in Carver Hall to University Fiber Optic Network -Install new lighting, ceiling, heating/air conditioning and window treatments to offices, classrooms, and auditorium in Carver Hall - Renovate labs offices, and lounge area in Ward Hall and construct new labs and research areas to support program activities in food safety, nutrition and health - Purchase scientific equipment - Wire and connect offices and labs in Ward Hall - Establish teleconferencing and distance education capabilities in Coltrane Hall	- Construct new greenhouse and small horse barn/corral in support of teaching programs in horticulture and animal sciences - Enhance research capabilities of Ward Hall in support of multi-disciplinary research and graduate education in food safety, nutrition and health - Enhance telecommunications infrastructure and capabilities of research facilities; Ward Hall and C. H. Moore Ag Research Facility and School of Ag-TV studio - Enhance infrastructure of research facilities, both physical and equipment needs, used in support of research and graduate education - Renovate and expand extension equipment/storage building to create bathrooms and new offices, conference room and meeting rooms
Langston University Langston, OK	- Construct/renovate Extension/Research Complex	- Construct/renovate Research/Extension Building - Construct/renovate greenhouse - Construct new facility to house teaching, research and extension programs
South Carolina State University Orangeburg, SC	- Construct/renovate Commercial Foodservice Management Laboratory	- Construct commercial dining/hospitality facility -Continue renovation at Staley Hall auditorium -Continue renovation at R. L. Hurst Building

Institution	1999	2000
Tennessee State University Nashville, TN	- Renovation and installation of equipment for a distance learning center -Purchase equipment	- Continue development of demonstration areas of distance learning center -Renovate and upgrade the child development laboratory
Prairie View A&M University Prairie View, TX	- Purchase office and audio-visual equipment for the Cooperative Agricultural Research Center (CARC) - Construct/renovate H.S. Estelle 4-H and Youth Camp - Renovate dairy goat center, creamery laboratory, meat laboratory, greenhouse, swine center, feed mill, poultry center, and human nutrition/food science laboratories.	- Continue to purchase office and audio-visual equipment for the CARC - Purchase vehicles for the CARC - Continue to construct H.S. Estelle 4-H and Youth Camp - Purchase equipment for communications network - Upgrade communications network with new equipment and connectivity for satellite video production - Continue renovation of dairy goat center, creamery laboratory, meat laboratory, greenhouse, swine center, feed mill, poultry center, and human nutrition/food science laboratories
Virginia State University Petersburg, VA	- Further develop the greenhouse facility - Construct the greenhouse - Purchase bus - Procure equipment for the Plant Science and Animal Science Labs	- Demolish current storage facility and construct a new facility - Construct a New Farm Service Center - Develop an electronic Classroom

BUDGET DECREASES FOR CONGRESSIONAL ADD-ONS

Mr. Skeen. For the CSREES special research grants and Federal administration projects proposed for termination, please provide by project, a table showing the fiscal year 2000 funding and the funding requested for fiscal year 2001 at the Agency Estimates, Department Estimates and President's Budget stages of the budget process.

(The information follows.)

RESEARCH AND EDUCATION
Special Research Grants and Federal Administration
BUDGET DECREASES FOR CONGRESSIONAL ADD-ONS

Project	FY 2000 Approp.	FY 2001 Agen. Est.	FY 2001 Dept. Est.	FY 2001 Pres. Budg
SPECIAL RESEARCH GRANTS				
Advanced spatial technologies, MS	$ 1,000,000	--	--	--
Aflatoxin research, IL	113,000	--	--	--
Agricultural diversification, HI	131,000	--	--	--
Agricultural diversity Red River, MN & ND	250,000	--	--	--
Agriculture-based industrial lubricants, IA	250,000	--	--	--
Agricultural tele-communications, NY	425,000	--	--	--
Agriculture water usage, GA	300,000	--	--	--
Alliance for food protection	300,000	--	--	--
Alternative crops, ND	550,000	--	--	--
Alternative crops for arid lands, TX	100,000	--	--	--
Alternative marine & fresh water species, MS	--	--	--	--
Alternative salmon products, AK	552,500	--	--	--
Animal Science Food Safety Consortium	1,521,000	--	--	--
Apple Fire Blight, NY & MI	500,000	--	--	--
Aquaculture, LA	330,000	--	--	--
Aquaculture, NC	255,000	--	--	--
Aquaculture, VA	100,000	--	--	--
Aquaculture, Stoneville, MS	592,000	--	--	--
Aquaculture product and marketing & development, WV	750,000	--	--	--
Babcock Institute, WI	510,000	--	--	--
Barley feed for rangeland cattle, MT	637,500	--	--	--
Biodiesel research, MO	152,000	--	--	--
Blocking anhydrous methamphetamine production (IA)	212,500	--	--	--
Bovine tuberculosis (MI)	170,000	--	--	--
Brucellosis vaccines, MT	425,000	--	--	--
Center for animal health and productivity, PA	113,000	--	--	--
Center for innovative food technology, OH	--	--	--	--
Center for rural studies, VT	200,000	--	--	--
Chesapeake Bay agroecology, MD	150,000	--	--	--
Chesapeake Bay aquaculture, MD	385,000	--	--	--
Citrus tristeza	595,000	--	--	--
Coastal cultivars (GA)	170,000	--	--	--
Competitiveness of agriculture products, WA	680,000	--	--	--
Contagious equine metritis, KY	--	--	--	--
Cool season legume research	329,000	--	--	--
Cotton research, TX	--	--	--	--
Cranberry/blueberry, MA	150,000	--	--	--
Cranberry/blueberry disease and breeding, NJ	220,000	--	--	--
Dairy & meat goat research, Prairie View A&M, TX	63,000	--	--	--
Delta rural revitalization, MS	148,000	--	--	--
Designing foods for health, TX	318,750	--	--	--
Diaprepes/root weevil (FL)	297,500	--	--	--
Drought mittigation, NE	200,000	--	--	--
Ecosystems, AL	500,000	--	--	--
Environmental research, NY	400,000	--	--	--
Environmental Risk Factors/Cancer, NY	170,000	--	--	--
Environmentally-safe products (VT)	178,000	--	--	--
Expanded wheat pasture, OK	285,000	--	--	--
Farm and rural business finance, IL & AR	87,000	--	--	--
Floriculture, HI	250,000	--	--	--
Food & Agriculture Policy Institute, IA & MO	800,000	--	--	--
Food irradiation, IA	280,000	--	--	--
Food Marketing Policy Center, CT	400,000	--	--	--
Food processing center, NE	42,000	--	--	--
Food quality, AK	350,000	--	--	--
Food safety, AL	446,250	--	--	--
Food systems research group, WI	425,000	--	--	--
Forages for advancing livestock production (KY)	212,500	--	--	--
Forestry research, AR	523,000	--	--	--
Fruit & vegetable market analysis, AZ & MO	320,000	--	--	--
Generic commodity promotion, NY	196,000	--	--	--
Global marketing support service, AR	127,000	--	--	--

Project	FY 2000 Approp.	FY 2001 Agen. Est.	FY 2001 Dept. Est.	FY 2001 Pres. Budg
Grain Sorghum, KS	106,000	--	--	--
Grass seed cropping systems for sustainable agriculture	423,000	--	--	--
Human nutrition, IA	473,000	--	--	--
Human nutrition, LA	752,000	--	--	--
Human nutrition, NY	622,000	--	--	--
Hydroponic tomatoes	200,000	--	--	--
Illinois-Missouri Alliance for Biotechnology	1,184,000	--	--	--
Improved dairy management, PA	296,000	--	--	--
Improved early detection of crop diseases (NC)	170,000	--	--	--
Improved fruit practices, MI	445,000	--	--	--
Infectious disease research, CO	255,000	--	--	--
Institute for food science and engineering, AR	1,250,000	--	--	--
Integrated production systems, OK	180,000	--	--	--
International agricultural market structures and institutions, KY	250,000	--	--	--
International arid lands consortium	400,000	--	--	--
Iowa Biotechnology Consortium	1,564,000	--	--	--
Jointed Goatgrass, WA	360,000	--	--	--
Livestock & dairy policy, NY & TX	475,000	--	--	--
Lowbush blueberry research, ME	220,000	--	--	--
Maple research, VT	180,000	--	--	--
Meadowfoam, OR	300,000	--	--	--
Michigan Biotechnology Institute	675,000	--	--	--
Midwest Advanced Food Manufacturing Alliance	423,000	--	--	--
Midwest agricultural products, IA	592,000	--	--	--
Milk safety, PA	297,500	--	--	--
Molluscan shellfish, OR	400,000	--	--	--
Multi-commodity research, OR	364,000	--	--	--
Multi-cropping strategies for aquaculture, HI	127,000	--	--	--
National Biological Impact				
Nematode resistance genetic engineering, NM	127,000	--	--	--
Nevada Arid Rangelands Initiative	255,000	--	--	--
New corp opportunities, AK	425,000	--	--	--
New corp opportunities, KY	595,000	--	--	--
Nonfood agricultural products, NE	64,000	--	--	--
Oil resources from desert plants, NM	175,000	--	--	--
Organic waste utilization, NM	106,000	--	--	--
Pasture and forage research, UT	225,000	--	--	--
Peach tree shortlife, SC	162,000	--	--	--
Peanut Allergy Reduction, SC	425,000	--	--	--
Pest control alternatives	106,000	--	--	--
Phytophthora root rot, NM	127,000	--	--	--
Plant, drought, & disease resistance gene cataloging, NM	212,500	--	--	--
Postharvest rice straw, CA	--	--	--	--
Potato research	1,308,000	--	--	--
Precision agriculture, KY	850,000	--	--	--
Preharvest food safety, KS	212,000	--	--	--
Preservation and processing, OK	226,000	--	--	--
Rangeland ecosystems, NM	280,000	--	--	--
Red snapper research, AL	510,000	--	--	--
Regional barley gene mapping project	425,000	--	--	--
Regionalized implications of farm programs, MO & TX	294,000	--	--	--
Rice Modeling	296,000	--	--	--
Rural policies institute NE, MO, & AR	644,000	--	--	--
Russian wheat aphid	280,000	--	--	--
Seafood harvesting, processing, and marketing, AK	552,500	--	--	--
Seafood and aquaculture harvesting, processing, marketing, MS	305,000	--	--	--
Seafood safety, MA	255,000	--	--	--
Small fruit research, WA, OR & ID	308,000	--	--	--
Southwest consortium for plant genetics & water resources	338,000	--	--	--
Soybean cyst nematode, MO	475,000	--	--	--
STEEP II - Water quality in Pacific Northwest	500,000	--	--	--
Sustainable agriculture, CA	255,000	--	--	--
Sustainable agriculture, MI	445,000	--	--	--
Sustainable agriculture and natural resources, PA	95,000	--	--	--
Sustainable agriculture systems, NE	59,000	--	--	--
Sustainable beef supply, MT	637,500	--	--	--
Sustainable pest management				

Project	FY 2000 Approp.	FY 2001 Agen. Est.	FY 2001 Dept. Est.	FY 2001 Pres. Budg.
for dryland wheat, MT	425,000	--	--	--
Swine waste management, NC	500,000	--	--	--
Tillage, silviculture, waste management, LA	212,000	--	--	--
Tomatoe wilt virus, GA	200,000	--	--	--
Trade and Policy Research Center, ND	--	--	--	--
Tropical aquaculture, FL	170,000	--	--	--
Tropical and subtropical research	2,724,000	--	--	--
Turkey coronavirus, IN	200,000	--	--	--
Urban pests, GA	64,000	--	--	--
Vidalia onions, GA	100,000	--	--	--
Viticulture, NY & CA	1,000,000	--	--	--
Water conservation, KS	79,000	--	--	--
Weed control	423,000	--	--	--
Wetland plants, LA	600,000	--	--	--
Wheat genetics, KS	261,000	--	--	--
Wood utilization	5,136,000	--	--	--
Wool research	300,000	--	--	--
Total	57,721,500	0	0	0
FEDERAL ADMINISTRATION (direct appropriation):				
Agricultural development in the American Pacific	564,000	--	--	--
Agricultural Waste Utilization	425,000	--	--	--
Alternative Fuels	218,000	--	--	--
Animal Waste Management, OK	250,000	--	--	--
Biotechnology Research, MS	425,000	--	--	--
Center for Agriculture & Rural Development	355,000	--	--	--
Center for innovative food technology, OH	381,000	--	--	--
Center for North American Studies	87,000	--	--	--
Climate Change Research, FL	178,000	--	--	--
Cotton Research, TX	178,000	--	--	--
Geographic Information	850,000	--	--	--
Gulf Coast Shrimp Aquaculture, AZ, HI, MS, MA, SC	3,354,000	--	--	--
Livestock Marketing Information Center, CO	170,000	--	--	--
Mariculture, NC	250,000	--	--	--
Mississippi Valley State University	583,000	--	--	--
National Center for Competitiveness	300,000	--	--	--
PM-10 study, CA & WA	873,000	--	--	--
Precision Agriculture, AL, TN	425,000	--	--	--
Water Quality, IL, ND	637,500	--	--	--
TOTAL Federal Administration	10,487,500	0	0	0

Economic Research Service

QUESTIONS SUBMITTED BY MR. SKEEN

Mr. Skeen: Please provide for the committee a detailed report on the studies and evaluations you are conducting directly related to the nation's domestic food and nutrition assistance programs. Include a brief description of each study and evaluation.

Response: The ERS Food Assistance and Nutrition Research Program for FY 1999 addressed the administration of food assistance programs, particularly as they have been affected by recent legislation, and developed basic information that will assist policy officials and program administrators with future issues of policy and program design. Examples of projects that address program administration are Program Access and Declining Food Stamp Program Participation, Program Integrity and Improved Service to the Working Poor Under Alternative Reporting Plans, and Report to Congress on WIC Cost-Containment Practices and Their Impacts. Projects that develop basic information for future decisions include several that support large national surveys of current and potential participants--for example, the National Health and Nutrition Examination Survey (NHANES) and the Early Childhood Longitudinal Studies--and those that examine the relationships among nutrition, food program, and health outcomes, including several that focus on childhood obesity.

I am providing a list of new food and nutrition assistance projects undertaken in FY 1999, followed by a list of continuing projects undertaken in FY 1998 for the record.

New Projects for FY 1999

Program Access and Declining Food Stamp Program Participation

This project investigates how policies and local administrative practices of the Food Stamp Program (FSP) and other related programs, such as Temporary Assistance for Needy Families (TANF), affect FSP participation nationally. The objectives of the study are to:

- identify and document local policies and practices that may impact the food stamp awareness and program participation of clients and potential clients;
- understand changes that followed the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in local caseworkers' and supervisors' perspectives on their roles and on program policies and operations;
- identify characteristics of households applying for public assistance, especially food stamps, and the disposition of their applications;
- evaluate the application processing, eligibility determination, and case dispositions of households, and compare the characteristics of different categories of applicants;
- analyze the relationships between policies and practices in local welfare offices and the disposition of food stamp cases, certification and re-certification rates, and changes in caseloads;

- describe the personal characteristics and reasons for nonparticipation of food-stamp eligible nonparticipating households, and compare reasons for different categories of nonparticipants. (This objective is in an option to the base contract).

The results of the study will help inform the current policy debate on factors behind the national decline in food stamp rolls, which fell by one-third between 1994 and 1998. The study will also shed light on the influences of post-PRWORA policy changes and local operating practices, including the various diversion practices, on FSP participation. Information obtained about the reasons for nonparticipation among eligible households in the post-PRWORA era will be especially valuable to FSP administrators. A fixed-price contract was awarded to Abt Associates, Inc. at a cost of $1,889,035 in FY 1999, with an option for $623,793. The study, including the option, is expected to be completed by March 2002.

What Explains Recent Changes in Food Stamp Program Caseloads?

This work is designed to improve models of caseload dynamics and enable policymakers and program analysts to better anticipate and forecast future fluctuations in FSP participation over the business cycle. The project employs variation in the timing and magnitude of changes in economic conditions and policy changes at the State level in order to estimate their effects on FSP caseload changes. Similar models have already been used extensively to study cash welfare programs. A novel feature of the project is its use of detailed information available in Quality Control Data on FSP participants. The work is a cooperative assistance agreement with Abt Associates, Inc. for a cost of $96,807 in FY 1999. A final report is expected to be completed in February 2001.

The Effects of Welfare Implementation on Food Stamp Caseloads

This work describes administrative and policy systems put in place under the welfare reforms of the PRWORA, and assesses their impacts on food stamp benefit delivery and the food stamp caseload. The work was funded as a cooperative research agreement with the Research Foundation of the State University of New York, The Nelson A. Rockefeller Institute for Government. It builds on the findings of the Rockefeller Institute's State Capacity Study and will rely on the Institute's 20-State network of field research teams to help carry out the project.

During the first stage of the project, information is being collected and assembled on food stamp caseloads, economic circumstances, relevant social changes, and program data to determine divergent patterns of program delivery among the States. At least eight States will then be selected for detailed data collection from two sites in each State in order to analyze specific institutional practices affecting food stamp caseloads. By focusing analytical efforts on understanding the differences in delivery systems for food stamps and welfare and how these systems have changed in recent years, the work will provide information to Federal, State, and local policymakers and administrators to address issues of food stamp access and caseload dynamics. The cost of the work is $200,079 in FY 1999. The work is expected to be completed by September 2002.

Causes and Consequences of Food Insufficiency After Welfare Reform

Food assistance and nutrition policies can be strengthened by a better understanding of the determinants of food insecurity and the link between food security and welfare reform. This work addresses several issues involving welfare reform and food insufficiency, including:

- the number of welfare families that have difficulties meeting their food, shelter, and other basic needs 1, 2 and 3 years after they are observed in the welfare rolls;
- how food insecurity and material hardship vary with recipients' work, welfare, and income trajectories;
- how mothers and children in food-insecure families differ in terms of physical and mental health and child development from those in food-secure families.

The research team is using the Women's Employment Survey, a longitudinal survey of female welfare recipients in Michigan, to address these questions. By using a longitudinal survey, researchers will be better able to look at both the short-term and longer term food insecurity status of low-income mothers and children. A grant was awarded to the The Regents of the University of Michigan at a cost of $200,354 in FY 1999. The expected completion date is December 2001.

Project on Devolution and Urban Change

A food stamp research component has been added to the Project on Devolution and Urban Change, an ongoing project conducted by Manpower Demonstration Research Project (MDRC) of the effects of welfare reform in four large metropolitan areas: Cleveland, Los Angeles, Miami, and Philadelphia. The work includes FSP caseload dynamics and the food and nutrition effects of various policy changes. The Project on Devolution and Urban Change, initiated in 1997 with major funding from a consortium of national and regional foundations, including Ford, Charles Stewart Mott, Kellog, and Pew, was designed to understand how devolution and the TANF block grants play out in four urban areas.

The project uses a multidisciplinary approach and is collecting data from a wide variety of sources. Administrative data for all families receiving Aid to Families with Dependent Children/TANF or food stamps dating back to 1992 are being combined with household and survey data, neighborhood indicators, ethnographic interviews, and observational and interview data from welfare offices, service providers, and community businesses. An initial round of welfare office implementation, ethnographic, and household survey data has been collected. The report Big Cities and Welfare Reform: Early Implementation and Ethnographic Findings from the Project on Devolution and Urban Change was released by MDRC in May 1999. ERS provided $300,000 in FY 1999 in support of the project through a collaborative effort with the U.S. Department of Health and Human Services (HHS). The expected completion date is September 2001.

Improving Access to Food Stamps for Low-Income Working Households

This work examines patterns of food stamp use and the relationship between food stamps, employment, food security, and material well-being among key subgroups of the working poor--primarily former cash welfare recipients. The project uses administrative and survey data collected as part of several current and prior evaluation projects by Manpower Demonstration Research Corporation (MDRC). These data will provide individual-level longitudinal information on the use of food stamps, cash assistance and benefit amounts over time. The project will also provide information on earnings from unemployment insurance data, and detailed survey data on household food sufficiency, food expenditures, material hardship, family income, and job characteristics.

Historically, household participation in the FSP and cash welfare have been closely related. Recent welfare reforms have focused on moving cash welfare recipients into the workforce. Many of these former cash welfare recipients remain eligible for food stamps, but do not receive them. There are a variety of factors that may explain the nonparticipation of low-income working families in the FSP, including lack of information about eligibility, diversion practices by local welfare offices, recertification requirements, stigma, benefit levels that are too low to offset the transactions costs of application, or a self-perceived lack of need. This work will provide information on the relative importance of a number of reasons for the nonparticipation in the FSP among low-income working families, as well as other factors related to FSP effectiveness. MDRC will provide to ERS a detailed analysis plan in February 2000. A grant was awarded to MDRC at a cost of $178,433 in FY 1999. The expected completion date is September 2001.

Restructuring Food Stamps To Help Working Families

This work examines ways in which the FSP might operate more effectively to supplement the incomes of working low-income families. The work draws on existing studies, analyzes data from the National Survey of America's Families and the Survey of Income and Program Participation, examines field data on administrative procedures at the local level, and reviews program rules and regulations for the FSP. PRWORA dramatically changed the ways in which Federal and State Governments provide assistance to low-income families. As a result, the FSP plays several roles in this evolving system of support:

- a nutrition-oriented in-kind benefit for low-income families;
- a way of encouraging the unemployed poor to enter the labor force and take a job;
- a support for families that experience loss of earnings substantial enough to render them eligible for assistance.

Current administrative practices and procedures in the FSP may not be well-suited to supporting all roles simultaneously. A grant was awarded to The Urban Institute at a cost of $50,000 in FY 1999. The project is expected to be completed by the end of December 2000.

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Program Integrity and Improved Service to the Working Poor Under Alternative Reporting Plans

This work evaluates alternative FSP reporting schemes to determine which best serves the working poor and preserves program integrity. In order to provide States greater flexibility in reporting requirements, The Hunger Prevention Act of 1988 permitted States to replace the previously mandated monthly reporting and retrospective budgeting (MRRB) requirement for households with earnings with a change reporting and prospective budgeting (CRPB) scheme. However, the State of California has been reluctant to adopt CRPB in place of MRRB because of concerns that benefit levels could differ from what clients currently receive, quality control (QC) error rates and fraud rates could increase, and fraud prosecutions could become more difficult. Despite these concerns, CRPB is appealing to county welfare agencies because they believe such a reporting system will greatly improve client service. County agencies also anticipate that CRPB will reduce the amount of time staff spend checking, processing, and acting on monthly reports, freeing them to spend more time working directly with clients to enhance their self-sufficiency.

Data from the upcoming shift in California from MRRB to CRPB will be used to compare the two schemes. The work will

- determine whether FSP eligibility and benefit levels change under the alternative reporting schemes;
- measure how the change from MRRB to CRPB affects administrative staff time and other costs;
- evaluate client satisfaction with CRPB relative to MRRB.

An experimental test will be performed involving two alternative timings for face-to-face recertification interviews with CRPB in order to determine the most effective ways to minimize threats to program integrity. The work will also develop a profiling model that program administrators can use to target resources in a way to avert errors and fraud. A cooperative assistance agreement was awarded to The SPHERE Institute in collaboration with the Solano County Health and Social Services Department. Its cost is $348,428 in FY 1999. The expected completion date of the project is July 2002.

Understanding Child Nutrition in the Year 2000: Dynamic Shifts and Their Determinants

Children's eating behaviors, including meal patterning, snacking patterns, and the nature and amount of food consumed away from home, have changed recently. These shifts may contribute to the increased prevalence of childhood obesity. This work will:

- model the determinants of snacking and eating-away-from-home behaviors among 2-18 year olds stratified by income using data from the USDA's CSFII 1994-96;
- characterize maternal employment and household participation in food assistance programs and examine if these factors modify snacking and eating-out behaviors, nutrient intakes, or overall diet quality of 2-18 year olds;

- examine the effects of snacking and eating-out behaviors on nutrient intake and overall diet quality of children.

There is a need to focus attention on understanding how food choices have changed and what are some of the factors responsible for these changes. As a major contributor to the diet of millions of low-income children and their families, the food and nutrition assistance programs might be a major contributor to some of the negative as well as positive patterns and trends. A cooperative research agreement for $200,000 in FY 1999 was awarded to the Carolina Population Center at the University of North Carolina at Chapel Hill. The work is expected to be completed in January 2002.

Obesity in Low-Income Mothers and Children

This work improves our understanding of the factors that influence childhood obesity. Utilizing 1988 to 2001 data that links birth certificate data with WIC program data files from Ohio and Kentucky, information from this project will be used to identify those infants participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) who are most likely to be overweight by 4 years of age. The prevalence of obesity in children, especially low-income children, is increasing. Childhood obesity increases the risk of adult obesity, which is associated with increased morbidity and other health problems. Once obesity develops at any age, it is difficult to treat. The current state of knowledge is limited for determining which newborns in WIC are the most likely to be overweight by 4 years of age. If those children at the highest risk of becoming an obese child could be identified at birth, then targeted prevention efforts could begin. Among the potential risk factors to be examined are the presence of an obese parent or an overweight sibling. A grant was awarded to Childrens Hospital Medical Center, University of Cincinnati at a cost of $350,000 in FY 1999. The work is expected to be completed by September 2002.

Factors Affecting Childhood Obesity Among Low-Income Households

This work examines several aspects of childhood obesity among low-income households suing data from the USDA's 1994-96 surveys of the Continuing Survey of Food Intakes by Individuals. It will:

- identify the prevalences of childhood obesity among low-income households;
- investigate and assess the likelihood of participation in food assistance programs, and maternal and household characteristics that may influence childhood obesity such as maternal obesity and diet and nutrition knowledge;
- estimate and quantify the effects on weight status of selected socioeconomic factors, dietary patterns such as intakes of fat and cholesterol, and diet quality represented by the Healthy Eating Index.

The growing prevalence of obesity and its occurrence at earlier ages are concerns of public health officials. Most previous studies have focused primarily on the causes and effects of obesity, and on issues related to health and nutrition. Similarly, studies of food assistance programs have

emphasized factors that affect participation in the programs, and the effects of food programs on food purchasing behaviors and nutrient intakes. Few studies have attempted to link childhood obesity with food assistance programs. Research is needed on the determinants of childhood obesity and the effect of food assistance programs on the likelihood of obesity for the children. A cooperative research agreement was awarded to The University of Georgia Research Foundation, Inc., at a cost of $99,828 in FY 1999. The work is expected to be completed in January 2002.

The Determinants of Overweight and Obesity Among Low-Income Children

This work uses data from the National Health and Nutrition Examination Survey III to examine the factors that influence obesity among low-income children with a focus on food insufficiency and food assistance program participation. The large increase observed in the prevalence of obesity, particularly among low-income children, makes it essential that we improve our understanding of the factors that affect obesity. Of particular interest are the findings that obesity, participation in food assistance programs, and food insufficiency each occur most commonly among low-income children. This work determines whether food insufficiency and food assistance program participation influence the likelihood of obesity, after controlling for possible confounding factors such as the child's birthweight. A cooperative research agreement was awarded to the Department of Pediatrics, Center for Nourishing the Future, Boston Medical Center at a cost of $124,999 in FY 1999. The work is expected to be completed by October 2002.

Economic Benefits of a Breast-Feeding Promotion: A Controlled Clinical Trial

This work evaluates the economic benefits of a pre- and postnatal breastfeeding promotion intervention by measuring its impact upon child health care costs, breastfeeding practices, and child health outcomes. Breastfeeding is the preferred infant-feeding method for most infants because of its beneficial impact upon general health and well-being. The most effective breastfeeding interventions include in-person and individualized lactation support spanning the pre-and postnatal periods. This type of lactation support reflects the kind of public health promotion activity that may be encouraged if the economic costs and benefits were known. The economic consequences of breastfeeding promotion interventions have not been evaluated, despite their potential potency and cost-savings.

This project is relevant to the USDA's WIC program, given its breastfeeding research, intent to promote breastfeeding, and the high proportion of WIC participants and eligibles in the low-income population. The intervention to be studied--individualized professional lactation support--is one that could be incorporated into WIC, either through expanding the existing program or by including a separate lactation support benefit. It is hypothesized that the economic benefits of an intensive breastfeeding promotion intervention will exceed the marginal economic costs of providing such an intervention. Further, it is hypothesized that the pre- and postnatal intervention will have a positive impact upon breastfeeding intentions, initiation, and duration, as well as be associated with reduced incidence and severity of specific infant and childhood illnesses. A grant was awarded to the Montefiore Medical Center, Albert Einstein College of

Medicine at a cost of $399,700 in FY 1999. The work is expected to be completed by September 2002.

Food Security and Health Outcomes in the California Health Interview Survey

This project's objectives are:

- addition of the USDA's Food Security Core Module to the planned California Health Interview Survey (CHIS) in order to obtain data suitable for investigating the relationships of household-level food insecurity and hunger to self-reported health status, health services utilization, dietary quality, and preventive health behaviors in a large multi-ethnic sample of California residents;
- development of analysis plans for using the CHIS to explore the relationships described above for adults, children, and adolescents and within Hispanic, non-Hispanic White, Korean-, Chinese-, and African-American subgroups.

Preparation of the food security module (including translations into languages other than English) and training materials will commence in January 2000. The CHIS will survey 55,000 households drawn to be representative of the noninstitutionalized population of California and also to be suitable for county-level analyses. The CHIS offers several opportunities to advance our understanding of health correlates and consequences of food insecurity and hunger in the United States. It will be significantly larger than other health-related surveys that incorporate food security measures. ERS is supporting this first phase of a larger project that will include analysis of the data in a subsequent year. A grant was awarded to The Regents of the University of California at Los Angeles for the UCLA Center for Human Nutrition, School of Public Health at a cost of $100,000 in FY 1999. Data collection of CHIS inclusive of the food security module will commence in July 2000 and is expected to be completed by October 2000.

Evaluating the Impact of School Breakfast on Learning: Design and Feasibility

This project develops a study design and analysis plan that would permit a scientifically defensible evaluation of the impact of school breakfast on learning and cognitive development of children. The study evaluates the relative merits of previous approaches and develops a new study design and analysis plan for a future evaluation. Special focus would be put on an analysis plan for the use of the Early Childhood Longitudinal Survey (ECLS) to achieve the study goal.

A growing body of evidence points to nutrition as a potentially powerful way through which learning and educational attainment can be fostered by public policy. This evidence has great relevance for evaluating the benefits of USDA's School Breakfast Program (SBP). Much of the research on SBP since its inception has focused on its effectiveness in improving the diets and nutritional status of children. Less attention has been devoted to assessing the effects of SBP on cognitive development and learning. The impact of school breakfast on the learning and cognitive development of children is difficult to assess, and the methodology of a scientifically defensible study is difficult to design. Many of the existing studies that have attempted such evaluations did not adequately control for confounding factors, such as pre-existing individual

differences or differences in the school environment. This contract will provide an authoritative review of the literature and develop a study design and protocol that would permit future evaluation of the impact of school breakfast on learning. A fixed-price contract was awarded to Mathematic Policy Research, Inc., at a cost of $289,311 in FY 1999. The study is expected to be completed in March 2001.

Hunger: Its Risk and Impact in Poor Female-Headed Households with Children

This work expands understanding of risk factors for household food insecurity/hunger and hunger's impact on children in low-income households headed by females. The work uses a comprehensive cross-sectional and longitudinal data set of poor female heads of household and their children that was collected in Worcester, Massachusetts from 1992 to 1997 by the Worcester Family Research Project. Mothers were assessed across economic, social, psychological, and health domains, using standardized instruments to measure a wide range of risk and protective factors. Their children were assessed for physical and emotional health and for academic achievement. The present work seeks to identify factors that predispose poor households to, or protect them from, food insecurity/hunger.

In conjunction with multivariate models, the data set's depth and breadth permit the most comprehensive assessment to date of the independent effect of food insecurity/hunger on critical child outcomes. Cross-sectional and longitudinal analyses of results will identify factors that make some children more vulnerable than others to food insecurity/hunger. The project extends previous work by broadening the child outcomes considered, utilizing direct child assessment measures, controlling for a greater range of potential confounding variables, including maternal, community, and child factors, and examining changes in principal study outcomes over a two-year long follow-up period. In addition, the work pays particular attention to the relationship between food assistance programs and food insecurity/hunger. In-depth analysis of the relationship between hunger (its presence, duration, and recurrence) and children's nutritional intake patterns, anthropometry, physical and emotional health, and learning, will be used to devise a screening measure for food insecurity/hunger that can identify high risk children and families for targeted interventions. A cooperative research agreement was awarded to the University of Massachusetts Medical School in FY 1999 at a cost of $250,000. The work is expected to be completed by September 2001.

Analysis of Data from the 1998 and 1999 Food Security Supplements to the Current Population Survey

This project supports and extends ERS's analysis of annual Food Security Survey data and the publication of findings. The study will:

- review, and revise as needed, ERS work on item calibrations, household scores, and estimated prevalences of food insecurity and hunger based on the 1998 and 1999 Food Security Supplements to the Current Population Surveys;

- extend the analysis of the food security data to a child-specific scale, and calculate household scores on this scale for 1995, 1996, and 1997 data as well as for 1998 and 1999;
- assess changes in the prevalence of food security and hunger in recent years;
- convene expert advisory panel to review and assess the current state of the art in measuring food security and hunger;
- detailed summary and technical reports on food security and hunger and the measurement of those phenomena at the household level.

Starting with the 1998 Food Security Supplement data, ERS began to conduct the preliminary analysis of the annual data on an in-house basis. ERS calculated household food security scores and food security status for the public-use microdata file, and published several important statistical series based on those data. Work under this contract will provide quality control checks on those processes, and will extend the scope and detail of the preliminary analysis and reports prepared by ERS. The work is a fixed-price contract with IQ Solutions, Inc. awarded in FY 1999 at a cost of $236,859. Work is expected to be completed in November 2000.

Community Food Security Assessment Conference

This project helps guide the development and implementation of a standardized set of measurement tools that can be used to assess various components of community food security. In 1999, the USDA began implementation of the Community Food Security Initiative (CFSI). The initiative is a partnership with States, communities, and nonprofit organizations to help develop sustainable local infrastructures to increase food security. Through a cross-agency initiative, the USDA will help States and communities obtain the tools they need to reduce hunger and food insecurity, improve nutrition, and enable low-income families to make a transition from poverty to self-sufficiency. As part of the CSFI, this project conducted several related tasks:

- carried out research on community food security to identify key components of a food-secure community;
- held a conference to develop a draft food security assessment instrument, with logistics for the conference
- assisted in a field test of the instrument in the Lower Mississippi River Delta Nutrition Intervention Research Initiative (Delta NIRI) project; and
- developed a toolkit that can be used for implementation of the final instrument in local communities.

ERS provided the $127,032 in FY 1999 to the USDA Graduate School for logistical support of the conference, with the Cooperative State Research, Education, and Extension Service (CSREES), USDA, making a contribution towards the project's cost. The conference was held on June 28-30, 1999, in Washington, D.C. The work on this agreement was completed in August 1999.

Community Food Security Toolkit

In 1999, the USDA began implementation of the Community Food Security Initiative (CFSI) and will prepare a manual and data collection instruments (toolkit) that organizations in local communities can use to assess community food security. The initiative is a partnership with States, communities, and nonprofit organizations to help develop sustainable local infrastructures to increase food security. Through a cross-agency initiative, the Department will help States and communities obtain the tools they need to reduce hunger and food insecurity, improve nutrition, and enable low-income families to make a transition from poverty to self-sufficiency.

On June 28-30, 1999, a conference planned by a multi-agency USDA planning team brought together individuals with expertise in community food security assessment. Workgroups formed at the conference are being asked to contribute to a draft set of food security assessment materials. Staff associated with the Lower Mississippi River Delta Nutrition Intervention Research Initiative (Delta NIRI) were assisting in field testing the draft toolkit in winter 2000. A fixed-price contract was awarded to IQ Solutions, Inc., at a cost of $149,570 in FY 1999. The final product will be designed for implementation in local communities. It is expected to be available in summer 2000.

Report to Congress on WIC Program Cost-Containment Practices and Their Impacts

This study is Congressionally mandated by the William F. Goodling Child Nutrition Reauthorization Act of 1998. The study assesses the effects of cost-containment practices by State agencies on:

- program participation;
- access and availability of prescribed foods;
- voucher redemption rates and actual food selections by participants;
- participants on special diets or specific food allergies;
- participant use and satisfaction of prescribed foods;
- achievement of positive health outcomes; and
- program costs.

The study provides the first systematic data on the balance struck by WIC state agencies between the goals of nutritional improvement and customer satisfaction and the need to make the most of available program funds. By reducing food costs, cost-containment practices have the potential to increase the number of eligible women, infants, and children served by WIC. Concerns have been raised, however, that overly restrictive policies may reduce participants' access to and consumption of prescribed foods, and may ultimately lead to reduced participation and adverse health impacts. In addition, some observers have questioned whether cost-containment practices save enough in food costs to offset their additional administrative costs.

The study will be conducted in six States selected to represent the three primary cost-containment practices: (1) vendor selection restrictions; (2) item selection restrictions; and (3) manufacturer rebate practices. Infant formula rebate practices are specifically excluded from this study. The

research will draw on a number of data sources, including: State WIC information systems, a survey of WIC participants, focus groups with WIC dropouts, a survey of WIC food availability and prices, supermarket scanner data, and interviews with State and local WIC staff. A fixed-price contract was awarded to Abt Associates, Inc. in FY 1999 for a base cost of $1,099,293. The contract contains an analysis option to begin within 24 months after the initial contract in the amount of $376,937. The final report to Congress is due in September 2002.

Identify and Evaluate Methods To Prevent Fraud and Abuse Among Staff and Participants in WIC

This study identifies and evaluates existing tools used by State or local agencies to detect fraud and abuse among staff or participants in WIC. Identification and evaluation of these tools are necessary to determine the best practices to prevent fraud. Emphasis will be placed on the manner in which existing survey data of WIC agencies, collected through General Accounting Office and Food and Nutrition Service (FNS) surveys, can be used to achieve the objectives of the study.

Some tools presently in use to indicate possible fraud among staff and participants include a high number of multiple births enrolled; an abnormal ratio of infants to children enrolled in a clinic; an unusual decrease in participant no-show rates; or a rapid increase in voucher redemption rates. Possible new tools will be identified, evaluated, and proposed. Determination of existing or new tools as best practices is dependent on factors including, but not limited to, the geographic location of WIC offices, number of participants in the WIC program, and resources available to implement fraud-prevention methods. Possible new tools will be proposed with the recognition that existing or new tools deemed as best practices will vary among WIC agencies. Once identified, best practices to prevent staff and participant fraud would be made available to all State and local agencies to help manage their WIC programs. A fixed-price contract was awarded to Applied Techno-Management Systems, Inc., for $225,550 in FY 1999. The project is expected to be completed in December 2000.

Summer Feeding Integrity Study: Design, Cost, and Feasibility Plan

This study designs an evaluation of the Summer Food Service Program (SFSP), and provides a cost estimate of completing the evaluation. The study determines appropriate sampling methods, and designs appropriate surveys, to extract detailed information about SFSP sites, sponsors, child participants, and eligible non-participants. It determines the cost of collecting and analyzing the above data at various levels of precision.

The Summer Food Service Program (SFSP) was established to provide nutritionally balanced meals to children of low-income households when school is not is session. However, there have been ongoing concerns regarding the integrity of the program and the extent to which the goal of hunger prevention is being met. Current legislation governing the SFSP is authorized through FY2003, after which reauthorization will be considered. This study must design an evaluation that, if undertaken, could be completed prior to the reauthorization hearings. Several characteristics of the program complicate an evaluation. For instance, data collection times are

limited by the fact that the program is only in operation during the summer months, and sponsor approval often does not occur until mid-May of the current year. Also, child attendance is not closely tracked, and little if any information about participants is collected at SFSP sites. This study must determine ways to address these and other issues that will be encountered during a full-scale evaluation. A fixed-price contract was awarded to Mathematica Policy Research, Inc., at a cost of $412,246 in FY 1999. The project is expected to be completed in October 2000.

Interpretation and Use of Dietary Reference Intakes

This project supports the work of the Uses Subcommittee of the National Academy of Sciences (NAS) in providing guidance to scientists, researchers, health professionals, and practitioners on the interpretations and uses of the new Dietary Reference Intakes (DRIs). The work addresses the use of dietary micronutrient recommendations and reference intakes for individuals and their applicability for assessing intakes of populations, formulation of appropriate dietary standards, and the research needed on which to base such policy decisions. The Recommended Dietary Allowances (RDAs) are gradually being replaced by the Dietary Reference Intakes (DRI), which provide users with four types of reference values: Estimated Average Requirements (EARs), Recommended Dietary Allowances, Adequate Intakes (AIs), and Tolerable Upper Intake Levels (ULs). Each reference value has a different intended use. Because adoption of DRIs represents a major shift from the use of RDAs, the Institute of Medicine established a Subcommittee on Interpretation and Uses of Dietary Reference Intakes to focus specifically on the application of the new DRIs. The Subcommittee will develop recommendations in four major areas:

- the appropriate uses of DRIs to assess or monitor the intakes of groups and of individuals, including specific applications to food assistance programs;
- appropriate uses of DRIs to plan for intakes by groups and by individuals, both to achieve sufficiency and to avoid potential adverse effects from high intakes;
- specific applications for each of the nutrient groups, including those already published; and
- appropriate uses of DRIs in nutrition education efforts.

ERS provided $100,000 in FY 1999 in support of the project through a collaborative effort with HHS. The component supported by ERS is expected to be completed in March 2000.

Committee on National Statistics

This project provides financial support for the Committee on National Statistics (CNSTAT) at the National Research Council, National Academy of Sciences, National Science Foundation, for support of its core research program. CNSTAT conducts research on statistical issues of national interest, including the 2000 Census, poverty estimates for small areas, measuring the effects of social welfare reform, performance measures of public health programs, the use of statistical formulas in legislation for fund allocations, confidentiality and data access, and other issues. ERS provided $26,200 to the National Science Foundation in FY 1999 in support of the project.

Food and Nutrition Summer Institute

This project provided financial support for the Food and Nutrition Summer Institute, which has the objectives of positioning the nutrition programs of historically black colleges and universities to meet research and education challenges, and of creating a stronger voice and action for nutrition education, research, and policy within the African-American community. The Summer Institute is supported by a wide variety of organizations including ERS, the Agricultural Research Service, the Howard School of Divinity, and the W.K. Kellogg Company. ERS provided $20,000 in FY 1999 to the Agricultural Research Service, USDA, in support of the conference. The conference was held on July 21-24, 1999, in Baltimore, Maryland.

Continuing Projects Supported with Both FY1998 and FY1999 Funds

Food Assistance and Nutrition Research Program's Small Grants Program

The Small Grants Program stimulates new and innovative research on food assistance and nutrition issues, and broadens the participation of social science scholars in these issues. The Small Grants Program makes several contributions:

- facilitates informed public debate on the role of food assistance programs in increasing the well-being of poor children and families, the fiscal impacts of these programs and their relationship to the larger economy;
- recognizes the increased value of State and local research as states add unique features to their welfare programs;
- delivers research funds to the individuals who are most familiar with the particular characteristics and needs of their States and regions;
- develops a better understanding of poverty issues and food assistance among social scientists, within their professional groups and in the communities where they work.

The Small Grants Program was established in 1998 and is being administered at academic institutions and affiliated research institutes. The five institutions include two national research institutes, one regional research center and two university departments, each with expertise relevant to the study of food assistance and nutrition programs. Each of the institutions takes a different aspect of food assistance or subgroup of recipients as its primary focus, which are listed below. The application and peer review processes are administered by the granting institutions, with most small grants in the range of $20,000 to $40,000. Small grants last for one year. Recipients of small grants in FY 1998 presented their results at a conference held October 14-15, 1999, in Washington, D.C. and are preparing final papers. Total cost for the Small Grants Program was $1,190,851 in FY 1998. The Small Grants Program was extended through FY 1999 at an additional cost of $750,000.

The Southern Rural Development Center at Mississippi State University focuses on food assistance research as it affects rural people, families, and communities in the South. The Center has also initiated a dialogue among scholars through the establishment of a Rural South Food Assistance Research Task Force. The Task Force meets to articulate research priorities on food assistance-related issues. (Awarded $150,000 in FY 1999; Awarded $222,000 in FY 1998)

The University of Arizona American Indian Studies Program is working with scholars at tribal colleges and elsewhere to support research addressing the unique position and problems of Native Americans with respect to food assistance. Their small grants program focuses on the relationship between food assistance programs on reservations and family poverty. (Awarded $150,000 in FY 1999; Awarded $246,224 in FY 1998)

The Institute for Research on Poverty at the University of Wisconsin is focusing on research that addresses the effects of food assistance on individual and family well-being and food security. (Awarded $150,000 in FY 1999; Awarded $234,843 in FY 1998)

The Joint Center for Poverty Research, University of Chicago and Northwestern University focuses on interactions between food assistance and other welfare programs, and linkages between the macroeconomy and food assistance. (Awarded $150,000 in FY 1999; Awarded $262,740 in FY 1998)

The University of California-Davis Department of Nutrition is focusing on research on the impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity. This program encourages examinations of multiple indicators of nutrition impact, and interdisciplinary approaches integrating epidemiology, economics, or anthropology with nutrition. (Awarded $150,000 in FY 1999; Awarded $225,024 in FY 1998)

Food and Nutrition Information Center (FNIC)

This project provides support to the National Agricultural Library (NAL) in systematically storing and disseminating information on the USDA's food assistance programs, nutrition education and related nutrition issues; it also supports NAL in hosting a web site and list server on these issues. The food and nutrition assistance clientele that receive special services from FNIC and NAL include: State agency staffs and clientele affiliated with FNS programs such as WIC; Commodity Supplemental Food Program (CSFP); National School Lunch and Breakfast Programs; State Nutrition Education and Training Program (NET); Child and Adult Care Food Program (CACFP); Summer Food Service Program (SFSP); Special Milk Program; and Food Distribution Program on Indian Reservations. FNIC continued to build and improve their web site, which was cited by a nutrition magazine as one of the top ten nutrition sites providing access to food and nutrition information. The cost of the project is $110,000 in FY 1998 and $200,000 in FY 1999.

Panel Study of Income Dynamics (PSID)

This project's objectives are to:

- develop and modify survey questions to improve estimates of food expenditures, participation in food assistance programs, expenditures on major consumer goods and services, nutritional behavior, and the calculation of food stamp eligibility;

- develop a wide array of data linking food insecurity and detailed family economic and demographic information, including income sources and amounts, employment, family composition changes, and residential location; and
- improve the collection of longitudinal data on family composition, income, use of public assistance, food security, and factors associated with family self-sufficiency on the Panel Study of Income Dynamics (PSID).

The PSID, begun in 1968, is a longitudinal study of a representative sample of U.S. individuals (men, women, and children) and the family units in which they reside. It emphasizes the dynamic aspects of economic and demographic behavior, but its content is broad, including sociological and psychological measures. As of 1995, the PSID had collected information about more than 50,000 individuals spanning as much as 28 years of their lives.

The Survey Research Center, Institute for Social Research, at the University of Michigan and ERS have developed new questions and modified existing questions on the PSID questionnaire pertaining to food expenditure and food assistance programs. Both the modification of existing food questions and the addition of other questions are necessary for program and policy analysis. These changes will provide a more complete accounting of food available to the household (either purchased or donated) and participation in food assistance programs which was inadequate in the previous version of the PSID. Initial questionnaire development has been completed. A shortened variant, about one-third as long, of the Food Security Supplement originally executed in conjunction with the Current Population Survey was included. Pretesting of the survey instrument was completed in early 1999 and final data collection was completed in October 1999. ERS provided $104,500 in FY 1999 and $444,830 in FY 1998 through the National Science Foundation.

WIC and Childhood Development: Early Childhood Longitudinal Study--Birth Cohort 2000

This project supports enhanced data collection necessary to examine the link between WIC participation in infancy and childhood to cognitive development, obesity, and food security. This is done by adding a bank of questions to the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) conducted by the National Center for Educational Statistics (NCES) of the U.S. Department of Education. Added questions include WIC and other food assistance program participation, infant feeding practices, immunizations, health care, height, weight, and related information.

ECLS-B is a nationally representative sample of about 12,000 children born during the year 2000 who will be followed through the first grade. The study focuses on factors affecting readiness for school and information will be collected each year from parents, teachers, birth records, and the children themselves. The list of items proposed by the USDA to be included in the survey relate to participation in the WIC as well as other USDA food-assistance programs; infant feeding practices; children's household food security; and children's height and weight. This study will provide a wealth of information of interest to USDA that has not been previously collected. For example, ECLS-B offers ERS the opportunity to examine the relationship between children's

participation in WIC and their cognitive performance and school progress. Recent findings indicate that obesity in children is increasing. Data from the ECLS-B may also shed some light on the relationship of infant feeding practices to the development of obesity in children. The USDA has provided the U.S. Department of Education with a list of proposed items to be included on the summer 1999 base year and the 2000 first year followup field tests of the ECLS-B. Design parameters are being finalized. Full-scale base year data collection will begin in June 2000. The project cost is $150,000 in FY 1999 for questionnaire design and pretesting, and $200,000 in FY 1998.

Measuring Food Security: Current Population Survey Supplements (April 1999, August 1998)

This project supports the national survey, administered by the Census Bureau, U.S. Department of Commerce, that obtains data to estimate the prevalence and severity of food security in the United States and to analyze the determinants of and changes in the level of food security. The Congressionally mandated 10-year Plan for the National Nutrition Monitoring and Related Research Program assigned the USDA a leadership role in developing, "a standardized mechanism and instruments for defining and obtaining data on the prevalence of 'food insecurity' or 'food insufficiency' in the U.S."

The first three waves of nationally representative food security data were collected using supplements with the April 1995, September 1996, and April 1997 Current Population Survey (CPS) and funded by FNS. Measures of food insecurity in the U.S. derived from the CPS Supplement data were published in a September 1997 USDA report, Household Food Security in the United States in 1995: Summary Report of the Food Security Measurement Project. ERS funded the 1998 and 1999 CPS Food Security Supplements. In October 1999, ERS published State-level estimates in Prevalence of Food Insecurity and Hunger, by State, 1996-98. The Census Bureau will be providing data files with the more recent data. Future reports based on these data will include a Summary Report and a Technical Report of the 1998 and 1999 data. These reports are due in the fourth quarter of 2000. The cost of the project is $440,000 in both FY 1999 and FY 1998.

National Health and Nutrition Examination Survey (NHANES IV)

This study will:

- collect data on diet, food consumption, and health status as part of the National Health and Nutrition Examination Survey (NHANES); and
- develop and modify survey questions to improve the measurement of the relationship between diet and health for low-income individuals.

The purpose of the survey, administered by HHS, is to provide nationally representative information on the health and nutritional status for the population of the United States. The Third National Health and Nutrition Examination Survey (NHANES III) was the seventh in a

series of large health examination surveys that began in 1960. In 1970, the nutrition component was expanded to provide data which assessed nutritional status and dietary practices.

The sample for this study of the U.S. population is selected from households in counties across the United States. About 40,000 persons 2 months of age and over are selected, including large samples of both young and old persons. In previous surveys, about 12,000 of the sample persons were black Americans, 12,000 were Mexican-Americans, and the remaining 16,000 were of all other race and ethnicity groups.

A sampling frame has been developed and questions are being pretested for reliability. Data collection is underway and will be completed by the end of the year 1999. The key variables of interest to ERS include dietary intake and nutritional status, anthropometric measurements, use of vitamin and mineral supplements and medications, tobacco and alcohol use, physical activity, and sociodemographic characteristics. ERS provided $125,000 in FY 1999 and $100,000 in FY 1998 in support of the project.

National Food Price and Sales Information System

This project's objectives are to:

- obtain the most recent nationally reliable data on average food prices, quantities, comparables, dollar sales, promotion information at the product group, class, brand, and item levels, including data on vitamins and nutritional supplements; and
- obtain historical time-series data to estimate food purchases for home consumption.

ERS and the Food and Drug Administration (FDA) jointly purchase data from Information Resources Incorporated (IRI) on food sales at retail stores around the country. The data result from obtaining computerized data encoded in the bar codes and nutrition labels contain grocery store sales and physical volume of scanable food products (at present, the data does not include random weight items, i.e., cut meats and produce). ERS partnered with the FDA to develop a request for proposal from interested vendors to furnish data on nationally representative food prices and quantities from supermarkets. The FDA contracted with IRI for the data and information system. Scanner data are a core component of research on retail food purchases. These data were essential to update the Thrifty Food Plan, the basis for food stamp allotments, to evaluate alternative food assistance programs, and to estimate the costs of healthier diets.

The primary uses of the data are to report volume and sales series for selected grocery store items to supplement the disappearance data series, provide per unit retail price data to supplement the shrinking Bureau of Labor Statistics (BLS) retail price series, provide analysis on the availability of healthy diets and their costs, and monitor the nutrient content of the national food supply, and components to a cost index for WIC. Scanner data can be analyzed monthly, quarterly, or annually. The data contain product characteristics, and also allow analysts to examine a wide range of items based on such qualities as flavor, container type, size, and manufacturer. Interagency agreements were entered into in FY 1999 and FY 1998 with the Food and Drug Administration, Public Health Service, HHS. The initial product delivery was received

September 1998. The cost was $235,000 in FY 1998, augmented by $6,000 in FY 1999 to obtain information on which items received various types of local promotional treatments.

Continuing Projects Supported from FY 1998 Funds Only

Family Child Care Homes Legislative Changes Study

This is a legislatively mandated study. Family child care homes participating in CACFP have new tiered-meal reimbursements. This study, conducted by Abt Associates, Inc., assesses the impact the new tiered-meal reimbursements have had on sponsoring organizations, participating and dropout homes, and children cared for by participating homes. The study collects and analyzes administrative and survey data and report to Congress on the effects.

The tiered reimbursement system was instituted on July 1, 1997, as part of the welfare reform legislation passed August 26, 1996. The new system provides that any family child care home located in a low-income area (an area where at least half of the children live in families with incomes below 185 percent of the poverty level or an area served by an elementary school in which at least half of the enrolled children are eligible for free or reduced-price school meals) continues to be reimbursed as before, as are homes where the provider's income is below 185 percent of the poverty level. This group of homes is referred to as tier 1 homes. All other homes are reimbursed at substantially lower rates. This latter group of homes, referred to as tier 2 homes, includes homes that are neither located in a low-income area nor operated by a low-income provider. Tier 2 homes can receive the higher tier 1 reimbursement rates for meals served to children from families with incomes below 185 percent of the poverty level.

This is a cost reimbursable contract, jointly funded by ERS and FNS. ERS manages the contract. The total cost of the project is estimated at $3,658,551 of which $1,959,007 is funded by ERS in FY 1998 and $1,699,544 is funded by FNS. The expected completion date is February 2001.

Report to Congress on Use of Food Stamps To Purchase Dietary Supplements

This project is part of a larger USDA effort to assess the state of scientific knowledge regarding the potential value of vitamin and mineral supplements in filling nutrient gaps and the comparative impact of vitamin and mineral supplements, improved diets, and the intake of fortified foods on health status and health care costs.

PRWORA requires the Secretary of Agriculture, consulting with appropriate outside experts, to conduct a study of the potential consequences of allowing the use of food stamps to purchase vitamins and minerals. Presently, food stamps can only be used for authorized food products and gardening supplies. This project funded the outside review and assessment of scientific knowledge. The major portion of the overall study was conducted by an internal USDA working group consisting of staff from the Center for Nutrition Policy and Promotion, the Agricultural Research Service, ERS, and FNS. FNS was the lead agency on the overall work. This portion of the project was conducted by Life Sciences Research Office, American Society for Nutritional

Sciences, through a cooperative assistance agreement at a cost of $120,250 in FY 1998. The final report was completed in November 1998. The report has been incorporated into The Use of Food Stamps to Purchase Vitamin and Mineral Supplements, delivered by FNS to Congress in September 1999.

Report to Congress on State Use of Funds To Increase Work Slots for Food Stamp Recipients

The Balanced Budget Act of 1997 increased the size of the Food Stamp Employment and Training (E&T) Program, enhanced its emphasis on assistance to unemployed able-bodied adults without dependents (ABAWDs), and changed how States are authorized to use E&T funds. In response to a legislatively mandated request from Congress, this study provides an assessment of the E&T Program due to these revisions. This study collects information in four main areas:

- the number of participants in workfare, education, and training programs in each State and the District of Columbia;
- a detailed description of the types of programs each State offers;
- the amounts of Federal funds spent, by State, on E&T Programs; and
- descriptions of participants, by State, using E&T program services, especially in terms of ABAWD status.

PRWORA dramatically changed the eligibility rules for ABAWDs. With the exception of regions of States receiving waivers due to a lack of employment opportunities, ABAWDs not working 20 or more hours per week; not participating in and complying with the requirements of a work program (excluding job search and job search training) at least 20 hours per week; or not participating in and complying with a workfare or comparable program, no longer qualify for food stamps for more than 3 months in any 36 month period. While the majority of E&T participants have always been ABAWDs, the Balanced Budget Act increased the amount of money for E&T Programs and limited the types of programs available for ABAWDs. A fixed-price contract was awarded to Health Systems Research, Inc., at a cost of $291,609 in FY 1998. Congress requested that the report be completed in February of 2000. However, due to the necessity of data collection, the report is not expected to be completed until June of 2000.

Expanded Study of Welfare Reform on Immigrants

Many legal immigrants who formerly received food stamps were made ineligible to receive them in PRWORA; subsequent legislation restored some eligibility, but most immigrant adults of working age are still ineligible. This is a 3-year study conducted by The Urban Institute and jointly funded by the USDA, the HHS, and the Immigration and Naturalization Service to assess the economic, social, nutritional, and health effects of changes in food stamp eligibility and other aspects of welfare reform on immigrants, their households, and communities.

The study samples immigrant food stamp users, non-users, and the elderly in Los Angeles and New York to determine how policy changes are impacting households. The study also includes interviews of households that were in The Urban Institute's National Survey of American

Families and provides longitudinal information and a check on retrospective information on food stamp receipt, food security and their relationship to economic, social, nutritional, and health outcomes. In addition, an examination of national data bases will determine whether results could be extrapolated to other sites. ERS contributed $300,000 to this study in FY 1998. Interviewing was underway in the fall of 1999. The project's scheduled completion date is 2001.

Temporary Assistance to Needy Families (TANF)-Leavers Use of Food Stamps

This project adds a FSP and rural component to a large multi-agency project being managed and directed by HHS. The project assesses the status of TANF recipients after they leave the TANF program, eligible families who are diverted before being enrolled in TANF, or eligible families who fail to enroll in TANF. The analysis includes former recipients and former eligibles of the FSP and the role that food stamps play in their overall well-being, with particular focus on former recipients or eligibles who reside in nonmetropolitan areas. The analysis addresses individuals' ability to obtain employment, and the support provided by their earnings, public programs besides TANF and food stamps, and other programs.

PRWORA fundamentally altered both the rules for FSP participation, and the importance of the FSP for households moving away from program assistance toward economic self-sufficiency. For households with children, the FSP may serve as a transitional program in which they participate for some time after leaving TANF. While it is likely that the strong economy has enabled many to move into the workplace, little beyond anecdotes indicates what happens to these households once they leave FSP. The project awarded grants to 13 States for a total of over $2.9 million in FY 1998. ERS contributed $250,000 in FY 1998 in support of the project.

Studies of Households Who Leave the Food Stamp Program

FSP caseloads have dropped markedly more than can be attributed to the growing economy. This project assesses the status of households and individuals who leave the FSP. One group of particular interest is able-bodied adults between the ages of 18 and 50 without dependents (ABAWDs), because the FSP changes were most strict for this subgroup. The analysis focuses on individual's ability to obtain employment, the support provided by their earnings and other income sources, and support provided by public and/or private programs. The research is being conducted by four grantees in four States.

Illinois Project Status: The project examines various aspects of the lives of former food stamp recipients in metropolitan and rural areas--studying factors such as recidivism and child care issues. Administrative records for a sample of participants who left the State food stamp program were obtained from the Illinois Department of Human Services. Analysis of administrative records has begun. The questionnaire was developed and a subsample of exiting households for enumeration was drawn. The questionnaire was pre-tested in June 1999. Based on pretest results the questionnaire was revised in July 1999. As of October 1, 1999 field work had begun, and enumeration was planned to continue through November 1999. ABAWD exiters are an extremely difficult group to locate, largely because they are a transient population. The number of completed interviews for this subgroup may not meet expectations. Enumeration of

the non-ABAWD subgroups is progressing as expected. The project is on schedule. A grant of $377,857 was awarded to Mathematica Policy Research, Inc., in FY 1998 for the project. The expected completion date is September 2000.

Iowa Project Status: This project focuses on a variety of policy issues, including exit decisions, programmatic linkages, employment and earnings, food and housing security, and health insurance coverage. Linked administrative data for households leaving the FSP in 1997 were obtained through working with the Iowa Department of Human Resources. Analysis of these data has begun. The questionnaire was developed, pre-tested, revised, and programmed for Computer Aided Telephone Interview administration. Enumerators were trained. A sample of the food stamp leavers from all cases exiting the program for at least 2 months during 1997 was drawn. Field work began at the end of May 1999 and continued through the reporting period The number of completed interviews for ABAWDs may not meet expectations. Enumeration of the non-ABAWD subgroups is progressing as expected. The project is on schedule. A grant of $400,000 was awarded to Iowa State University in FY 1998 for the project. The expected completion date is September 2000.

South Carolina Project Status: The project studies former food stamp recipients to ascertain their current well-being, specifically comparing those who are working and managing their nutritional needs with those who are not. The questionnaire and the survey sample design have been developed. Staff have been hired to manage survey enumeration. Enumeration began in the fall of 1999. A compilation of administrative data for analysis has been begun. The project will likely be completed on schedule. A grant of $310,746 was awarded to the South Carolina Department of Social Services in FY 1998 for the project. The expected completion date is October 2000.

Arizona Project Status: The project examines the extent to which households in Maricopa and Pinal Counties (the Phoenix area) that have left the program have made successful transitions to economic self-sufficiency. The analysis includes both administrative data complied statewide and household survey data. Three types of households are surveyed: ABAWDs, non-ABAWD households who received no TANF-funded cash assistance in the year prior to closure, and non-ABAWD households who received prior-year cash assistance. Analysis has begun of administrative data for the January 1997 - March 1999 period for persons leaving the FSP during the calender year 1997. A questionnaire was developed and pre-tested, and a sample was drawn for the survey of participants leaving the FSP in the two counties. The revised survey instrument was programmed for Computer Aided Telephone Interview/Computer Aided Personal Interview administration, and enumerator training was completed. As of October 1, 1999, 654 interviews had been completed. The number of completed interviews for ABAWDs may not meet expectations. Enumeration of the non-ABAWD subgroups is progressing as expected. Analysis continued into the fall of 1999. The project is on schedule. A grant of $399,471 was awarded in FY 1998 to Abt Associates, Inc., for the project. The expected completion date is September 2000.

A Study of the Emergency Food Assistance System: Provider and Recipient Characteristics

The study has three main objectives:

- to develop an understanding, through a nationally representative sample, of the characteristics, operating structure, and service areas of food banks, food pantries, and emergency kitchens;
- to understand the resource base of food banks, food pantries, and emergency kitchens and the capacity of these providers to manage current and future changes in food demand and food resources; and
- to develop a national estimate of the total number of recipients served and the total quantity and type of food, by source, that flows into food banks, food pantries, and emergency kitchens.

Many emergency food assistance providers are reporting increased demand for their services as a result of changes in the Nation's welfare and food assistance safety net under PRWORA as well as decreasing ability to meet the additional demand. Emergency food assistance from food pantries, emergency kitchens, or similar programs is a coping mechanism used by low-income households to augment household food supplies. The 1997 publication Hunger 1997: The Faces & Facts by Second Harvest, the Nation's largest charitable hunger relief organization, reported that 21 million people received emergency food assistance from Second Harvest-affiliated providers in 1997. The USDA provides commodity and administrative support to emergency food assistance providers through The Emergency Food Assistance Program (TEFAP). The USDA's National Food Recovery and Gleaning Initiative seeks to increase the quantity of surplus food recovered from the food marketing system and distributed to needy households through emergency food assistance providers by 33 percent by the year 2000. A contract was awarded in FY 1998 to Mathematica Policy Research, Inc., for $1,493,061. Data collection is due to be completed by the end of February 2000 with the final report ready for USDA clearance in mid-July. The completion date is expected to be October 2000.

Changes in the Characteristics of the Food Stamp Program Population Under Welfare Reform

This study determines how characteristics of the food stamp population have changed under welfare reform by examining the characteristics of FSP participants before and after different State welfare reform policies were implemented. Specific topics to be considered include: impacts on the proportion of cases with earnings, Able-Bodied Adults Without Dependents exemptions, incentives for marriage and savings, intensity of welfare-to-work emphasis, earned income disregards, and time limits.

The nature of welfare reform programs currently in place, whether developed under waivers or under the PRWORA, vary substantially by State. This variation across States and across time provides a "natural experiment" for studying changes in the characteristics of the FSP caseload. Results will provide policymakers with important information on how much and in what ways the FSP caseload is changing, and on how well the FSP is continuing its role as a safety net for

low-income households. The work is using administrative data from the Integrated Quality Control System database for FY 1992-1998. A cooperative assistance agreement with Mathematica Policy Research, Inc., was awarded in FY 1998 at a cost of $127,383. A classification of State policies and descriptive analysis has been completed. The final report summarizing the descriptive and econometric analyses is expected in third-quarter 2000.

Welfare Reform Effects on Food Assistance Use and Family Well-Being

This work examines three aspects of the effects of welfare reform:

- the proportion of low-income families and single individuals who received food assistance before and after welfare reform and the characteristics of food assistance recipients before and after welfare reform;
- changes in the pattern of spells of cash public assistance and food-stamp receipt; and
- changes in economic resources and food expenditures of low-income individuals and families and changes in food insecurity between 1997 and 1999 among low-income families with children under age 13.

The work uses the Panel Study of Income Dynamics, a prominent longitudinal nationally representative survey, which has returned to the same group of families over the years from 1968 to the present. It is administered through the Institute for Social Research at the University of Michigan. Because it is longitudinal, it is particularly well-suited for analyzing changes in conditions for individual families over time, including changes in their program participation status and in their food insecurity status. A cooperative research agreement in the amount of $300,000 was awarded to The Regents of the University of Michigan in FY 1998. A conference paper based on the 1992-99 Panel Study of Income Dynamics (PSID) has been accepted for the Allied Social Science Association meetings in January 2000. It has been expected that further analyses of the 1992-97 PSID would be completed in March 2000. Analysis of changes between the 1997 and 1999 PSID are expected to be completed in March 2001, with a final report expected to be completed in September 2001.

The Changing Welfare System in Rural Areas

This work provides an improved understanding of the challenges facing the USDA's food assistance programs and other programs in rural areas, and determines the differences, if any, in policies and practices for delivery of program benefits to rural and urban residents. Changes in food assistance and other welfare programs as a consequence of welfare reform may not have the same effect in urban and rural areas because of differences in access to transportation, welfare offices, child care, informal social support networks, and jobs. In addition, policies and practices may be different in largely rural States.

The work is using a combination of quantitative and qualitative research methods to analyze program rules, program implementation, and the effects arising from increased State discretion over welfare policies. The first step was to specify how Federal, State, and local policies embedded in today's cash and non-cash assistance programs and tax credits affect work

incentives and income packaging. The second step was to determine the administrative rules and practices in selected State and rural areas and how they influence the structure of benefits. The third step is to analyze the relationship between State welfare practices, labor market conditions, work effort, and the distribution of food stamp benefits. The fourth step is to examine how families in rural areas experience welfare changes differently from families in urban areas. Quantitative research and field work in three to four rural communities in four States will investigate this issue. A report on the first two steps was delivered to ERS in early summer 1999. Field work for the case studies is nearing completion. The Urban Institute was awarded a cooperative assistance agreement for $249,617 in FY 1998. The work is expected to be completed by September 2000.

Welfare and Food Assistance at the State Level: Methods and Iowa Estimates

This work is designed to help better understand economic and programmatic forces affecting low-income households in Iowa under the new welfare policy. It also assesses the impact of Iowa's system of welfare programs on Federal food assistance programs in the State. Three specific goals are:

- develop a framework for evaluating multi-regional, multi-jurisdictional, and programmatic linkages with special attention to food and income security programs;
- evaluate programmatic linkages, FSP and other welfare program participation, and labor force behavior; and
- update the modeling framework to project the impact of various economic shocks.

The work will be carried out using econometric analysis and a Computable General Equilibrium (CGE) model. Data sources will include Iowa administrative data, supplemented with the use of various national survey data sources. Completed or on-going steps include: (1) merging of various administrative Iowa State administrative data sets and national data sets; (2) preliminary analysis of the administrative data sets; (3) literature review; (4) revision of research objectives based on available data; (5) development of FY Social Accounting Matrix (SAM) for Iowa; and (6) development of CGE model for the midwest region. A cooperative research agreement was awarded to Iowa State University for $233,170 in FY 1998. The expected date of completion is January 2001.

The Impact of Welfare Reform and the Macroeconomy on Food Stamp Caseloads and Expenditures

This project addresses the following questions about food stamp caseloads and expenditures:

- How cyclically sensitive are food stamp caseloads and expenditures to changes in local labor market conditions?
- How do State-specific differences in pre- and post-AFDC and FSP parameters affect food stamp caseloads and expenditures?

- Are there interactive effects between the business cycle and TANF program parameters on food stamp caseloads and expenditures?

To address these questions, the project employs the multivariate methodology developed in previous work by the cooperators which studied the responsiveness of State-specific AFDC caseloads to business-cycle conditions and pre-TANF welfare waivers. The data come from four sources: (1) food stamp caseloads, expenditures, and program changes from FNS; (2) labor-market indicators reported by the U.S. Bureau of Labor Statistics; (3) data on State population from the U.S. Census Bureau; and (4) welfare waivers granted under AFDC and TANF program parameters from HHS. The results of this work will enhance the USDA's understanding of the determinants of changes in food stamp caseload and expenditures, and enhance the target efficiency in forecasting food stamp caseloads and expenditures over the business cycle in response to the Federal overhaul of the U.S. transfer system. A cooperative research agreement was awarded to the University of Oregon for $75,000 in FY 1998. The work is expected to be completed by September 2000.

Consequences of Welfare Reform and Economic Change for the FSP and the Economy as a Whole

The objective of this research is to examine the linkages between the FSP, other welfare programs, and the general economy. The primary areas of investigation include:

- examining the characteristics of the welfare assistance packages being developed at the State level and assessing the impact they may have on Federal food assistance program participation rates and expenditures;
- examining the post-TANF relationship between national and State-level macroeconomic conditions and FSP participation and benefit levels; and
- linking an operational microsimulation model to an economy-wide model for analysis of the FSP and its relation to other welfare programs and the general economy.

The work uses a microsimulation model developed to simulate household responses to changes in FSP, welfare, and child care policy. The work addresses the following three tasks:

- how will changes in State TANF programs and State child care programs affect State FSP participation and benefits;
- how have changes in State unemployment rates affected State FSP participation and benefits during the 1990s, and how will these effects differ as State TANF programs vary in the future; and
- how can the simulation model be linked to ERS's Computable General Equilibrium model of the agricultural sector and the economy at large.

Simulations from the microsimulation model, under task 1 and 2 of this project, provide one basis for assessing the relative impact of changes in State unemployment rates and State welfare programs on the FSP caseload and benefits. A cooperative assistance agreement was awarded to Mathematica Policy Research, Inc., (MPR) for $374,229 in FY 1998 to study the consequences

of welfare reform and economic change for the FSP and the economy as a whole The work is expected to be completed by September 2000.

Study of Re-Engineering the Welfare System

Welfare reform has had a significant impact on how services are delivered to FSP clients. This study examines the extent and nature of States' welfare administrative re-engineering efforts as they affect the FSP administrative processes. This includes changes associated with welfare reform that effect either (1) interaction between food stamp applicants and caseworkers or (2) the efficiency or the integrity of the FSP. The focus of the work is to identify the States' administrative practices that are innovations (or departures) from prior practices. A fixed-price contract was awarded to Health Systems Research, Inc., at a cost of $362,443 in FY 1998. The anticipated completion date is fourth-quarter 2000.

Simplified Food Stamp Program Technical Assistance

This study conducts microsimulations and related analysis of alternative State-level changes to program options in the Simplified Food Stamp Programs and evaluates the potential effects on program eligibility, participation, benefit levels, and costs.

PRWORA allows States to create a Simplified Food Stamp Program (SFSP) for households whose members are receiving TANF. Two of the greatest challenges for implementing the simplified program option will be, first, for States to understand the consequences of their proposed design and, second, for FNS to make cost neutrality and benefit impact determinations of the simplified program plans submitted by States.

The purpose of this study is to obtain the technical and statistical services needed to assist FNS in the provision of technical assistance, mostly in the form of microsimulation analyses, to users including:

- States interested in developing a simplified program so that they can understand the probable effects of choices they are making before they submit a proposed SFSP plan to FNS; and
- administrators of the FSP to help assess cost neutrality and benefit impacts of the proposed SFSP plans (or proposed SFSP demonstrations, if legislation is not enacted) submitted by States for FNS approval.

Models will be updated and modified, as needed, to simulate the effects on recipient's food stamp benefits and total FSP benefit costs of alternate State designs for a SFSP. The effects of up to 40 SFSP designs for 8 different States will be simulated. A design is the equivalent to a set of program reforms. This project funds microsimulations and related analysis of alternative

State-level changes to program options in the SFSPs. The analyses will evaluate the potential effects of various program options on program eligibility, participation, benefit levels, and costs. The cost of the project, conducted by Mathematica Policy Research, Inc., is $88,389 in FY 1998. The project is expected to be completed in June 2000.

The Extent of Trafficking in the Food Stamp Program After Welfare Reform.

This study provides updated estimates of food stamp trafficking using current data and provides a longitudinal comparison of the prevalence of trafficking before and shortly after initial implementation of welfare reform. In 1995, FNS created the first data-based, national estimate that about $815 million was trafficked for cash from the Government by stores during FY 1993 (which amounts to just under 4 cents of every dollar of food stamp benefits issued). The vast changes initiated by the landmark welfare reform legislation may have changed the prevalence of trafficking, although the direction of the change is uncertain. Welfare reform is changing the profile of program participants. In addition, it mandated the use of electronic benefit transfer and the spread of this technology (already about one-third the national caseload) may further alter the prevalence of trafficking. For the updated estimates, tables on the extent of trafficking were reported complete in June 1999. For the longitudinal comparison, analysis is expected to be completed in April 2000. Data and codebook are expected in November 2000. The cost of the project, conducted by Macro International, Inc., is $199,921 in FY 1998.

Early Childhood Longitudinal Survey-Kindergarten Cohort

This project provided funding to include the USDA's food security module and other items in the Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K) sponsored by the National Center for Educational Statistics of the U.S. Department of Education. The project will provide descriptive data on children's status at entry into school, children's transition into school, participation in the school breakfast and lunch programs, and their progress through fifth grade, including data that allows for the examination of the relationship between food security/hunger, cognitive development, and school performance. ECLS-K is a nationally representative sample of about 23,000 children enrolled in about 1,000 kindergarten programs during the 1998-99 school year who will be followed through the fifth grade. The work focuses on factors affecting success in school, and information will be collected each year from parents, teachers, and the children themselves. ERS contributed $500,000 in FY 1998 to support the project.

Research To Strengthen and Improve Measures of Food Security

This work provides a research base for improving the measurement of food security and hunger at the household level by:

- assessing the effects of questionnaire structure, item content and wording, screening patterns, split-panels, and non-response patterns in the first three years of data from the Food Security Supplements to the Current Population Survey;
- investigating alternative approaches for scaling food security items and classifying households into food security categories; and

- developing and field testing a set of questions for future modifications of the food security scale.

The Congressionally mandated 10-year Plan for the National Nutrition Monitoring and Related Research Program assigned the USDA a leadership role in developing, "a standardized mechanism and instruments for defining and obtaining data on the prevalence of 'food insecurity' or 'food insufficiency' in the U.S." Nationally representative data were collected using supplements to the Current Population Survey (CPS) in 1995, 1996 and 1997. Annual CPS supplements are planned for 1998 and beyond. The survey module is also planned for implementation in the USDA's Continuing Survey of Food Intake by Individuals (CSFII), the National Center for Health Statistics' National Health and Nutrition Examination Survey (NHANES), and other national, State, and local surveys.

A significant amount of research has gone into developing and testing the questionnaire and developing and testing scaled measures based on it. National prevalence of food insecurity and hunger were estimated for 1995, and prevalence estimates are currently being calculated for 1996 and 1997. However, additional research is needed to assess, improve, and strengthen the measurement methods and techniques. This project targets the research issues of highest priority to those ends.

Improving the reliability and validity of measures of food insecurity and hunger will improve USDA's ability to monitor the need for and effect of its nutrition assistance programs, to target them more effectively, and to improve their efficiency. A cooperative assistance agreement for $200,000 was established with Iowa State University in FY 1998. Cooperators have completed an extensive critique of the measurement model and have begun more detailed work on high-priority issues that were identified through the process. The expected project completion date is September 2000.

Economic Research Service's Second Food Security Conference.

This conference brought together experts from government, universities, research institutes, and public interest groups with an interest in food security measurement. The focus was to provide direction for future research needs and data collection, including the potential for measurement of individual food security, and to foster interaction among public and private researchers in the involvement, refinement, validation, and use of the USDA/HHS food security measurement scale. The conference is part of a continuing, collaborative effort of several federal agencies in the USDA and U.S. Department of Health and Human Services to advance research understanding in this area. A fixed-price contract was awarded to IQ Solutions, Inc., at a cost of $100,000. The conference was held in February 1999.

Evaluation of Food Stamp Program Nutrition Education

This work develops methodology and validates instruments to support evaluation of food stamp nutrition education activities. Methods and instruments are needed which minimize respondent burden, are inexpensive and easy to administer, and are appropriate for low-literacy and/or low-

income populations. The project is conducting research to support the development and validation of a methodology to evaluate the FSP's nutrition education activities. The specific tasks conducted in the first year included:

- using a team of national experts to complete a review and synthesis of the reliability and sensitivity of current methods in order to change potential measures with low-income, low literacy audiences;
- investigate the reliability and validity of potential indicators on data sources such as the Expanded Food and Nutrition Education Program's Evaluation/Reporting System (E/RS) and major State survey instruments; and
- update and publish white papers and a detailed guide on how to utilize these tools in evaluation.

During the second year of the project, Research Triangle Institute is testing the implementation of the data collection in one region of the country while sampling other states around the Nation. During the third year of the project, they will prepare a national synthesis that describes the accomplishments of nutrition education in the United States. This project will result in a practical ongoing system that can be used to evaluate the diversity of nutrition education programs. A cooperative assistance agreement for $498,940 was awarded in FY 1998 to Research Triangle Institute. A revised draft of a set of "White Papers" to assist practitioners on how and when to utilize specific tools in evaluation is being readied for publication. These White Papers are scheduled to be submitted for publication in the first quarter of the second year of the project. Completion is expected in September 2001.

Diet Intake and Health Outcomes

This work develops and evaluates a dietary assessment tool that can be used across the programs in WIC, recognizing that adaptations may be needed for culturally diverse populations. The tool will serve several functions such as screening for dietary patterns that do not meet Federal dietary recommendations, facilitating the triage of patients for services, and serving as the basis for general nutrition education.

Because there are clear health and nutrition risks associated with selected inappropriate dietary patterns, there is interest in improving, standardizing, and simplifying the tools used for obtaining and assessing information on food intake, dietary patterns, and nutritional quality, particularly for children ages 2-4 years who may be eligible to participate in WIC. Therefore, the Harvard School of Public Health will collaborate with the state health departments in North Dakota, Missouri and Massachusetts, and the Division of Nutrition Control and Prevention, to study three uses of the validated Harvard food frequency questionnaire (HFFQ) for children 1 to 5 years of age participating in WIC. The tool to be developed is for use with children 2-4 years of age who may be eligible for WIC. Specifically, the project will:

- evaluate and improve the HFFQ to better facilitate nutrition education, food package decisions, and referrals;

- design, implement, and evaluate the use of aggregate nutrition data for program planning and evaluation at the State and national levels by aggregating diet assessment and administrative data from WIC programs in collaborating States;
- examine relations between diets of children ages 2 to 4 and childhood obesity as measured by excess adiposity among 4-year-old children, using prospective data collected through the WIC program.

We hypothesize that a high-fat diet leads to greater childhood obesity and that a diet high in fruits, vegetables, and fiber is associated with lower levels of obesity. Building on the food pyramid, health outcomes from this work, and other sources will define diet quality for this age group. Guidance will be provided throughout the work by forming a national advisory board with members from the National Association of WIC Directors, the Centers for Disease Control and Prevention and the USDA.

Concluding the first year, the project is generally on schedule, although there has been a delay in expanding the validity of the dietary assessment tool to include African-American and Hispanic children. That validation process is expected to be conducted and completed in the second year of the project. A cooperative assistance agreement was awarded to the Harvard School of Public Health in FY 1998 to conduct research to improve assessment, policy analysis, and health outcomes on dietary intake. The cost of this work is $490,209. The project is expected to be completed in September 2000.

Research To Assess Links Between Diet Quality and Health

This work analyzes and improves our understanding of the long-term relationship between diet quality and health status of men and women over time. This project assesses whether overall measures of diet quality such as the USDA's Healthy Eating Index (HEI) predict the rate of occurrence of individual components of the adverse health outcome measure (cardiovascular disease, cancer, death).

Food assistance and nutrition policies can be strengthened by better knowledge of the links between diet quality and health outcomes. The USDA has recently developed the HEI for measuring the overall diet quality of Americans. This work will be crucial in showing how well an HEI-type measure can predict future health outcomes. The Health Professionals Follow-up Study (HPFS) and the Nurses' Health Study (NHS), both undertaken by the Harvard School of Public Health, are among the few surveys that provide data on both diet and health of individuals over a long time period, and thus make a detailed investigation possible. A cooperative assistance agreement of $97,098 was awarded to the Harvard School of Public Health in FY 1998. A seminar on the first part of the findings was held by cooperators at ERS in February 1999. Two research papers have been prepared and submitted for review in professional journals. The work was completed in September 1999.

Development and Evaluation of the Nutritional Anthropometric Assessment Software in WIC Clinics (Epi Info 2000/Nutstat Module)

This work supports further development, pilot testing, and evaluation of the nutritional anthropometric software, NUTSTAT, for implementation in clinic operations of WIC. The software improvements will enhance the ability of WIC clinicians to properly assess height-for-age, weight-for-age, and weight-for-height for program participants relative to national population standards using newly revised reference curves. The National Center for Health Statistics (NCHS) and the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) at the Centers for Disease Control and Prevention (CDC) are revising the reference curves.

Considerable progress has been made in the development of the general features of NUSTAT, such as the ability to store and recall earlier measurements, features for use of the program on Local Area Networks and with databases other than Microsoft Access, features for use of the program through the Internet, printing features, and a help file mechanism. The continued absence of the revised reference curves, which will be incorporated into the software, has prevented release of the software for field testing. However, the program has been tested in two courses conducted for teachers of Epi Info, in meetings with representatives from CDC's Epidemiology Program office and the Division of Nutrition and Physical Activity, and with FNS. These activities led to a complete redesign of the main screen. A planning meeting was held at NCHS in Washington, DC on June 14, 1999, at which the general direction of the project was reviewed and several ideas for future implementation were provided. The project has sufficient funding obligated to complete the programming tasks during the first part of FY 2000 (the reference curves are expected to become available shortly). The cost of the project is $76,393 in FY 1998. The expected completion date is the second quarter of 2000.

Research on Breastfed Infants' Growth

This work conducts research on optimal growth rates for breastfed infants. The clinicians in WIC require appropriate infant growth charts to determine when, and if, breastfeeding should be supplemented with formula to support weight gain. Current infant growth charts are based predominately on formula-fed infants, and hence, may suggest faster weight gains than optimal and unnecessary formula supplements.

This project funds the U.S. longitudinal study, which will follow a sample of breastfed babies for more than 2 years (22 data points for each baby). The U.S. sample is essential if U.S. physicians and health care workers are to accept and use The World Health Organization (WHO) infant growth charts. The project is of particular relevance to WIC, which promotes the initiation and duration of breastfeeding. Current growth charts are based on surveillance data comprised mainly from formula-fed babies who are thought to have higher, though not necessarily optimal or appropriate growth rates for comparison with breastfed infants. The higher growth rate standards may lead health care workers to interpret the slower growth of breast-fed infants at about 4 months as indicative of growth faltering and erroneously recommend supplementation with formula or termination of breastfeeding. This could reduce the health benefits to infants associated with breastfeeding. A grant for $800,000 was awarded to WHO in FY 1998 to fund a U.S. site at the University of California, Davis for their international study to develop growth charts for healthy breastfed babies. The work is expected to be completed by July 2001.

Assessment of Computer Matching in the Food Stamp Program.

This work examines how States are currently using or planning to use computer matching strategies to reduce fraud and abuse in their food stamp and other assistance programs. By collecting and disseminating information on computer matching, this project helps States improve program integrity and support FNS oversight to ensure that States manage the FSP as efficiently as possible.

FNS needs information on whether or not and how states use external data bases available to them for several years (such as data from the Income Eligibility Verification System (IEVS), the Federal Tax Refund Offset Program (FTROP) and the State Alien Verification match to Immigration and Naturalization Service (SAVE)). FNS also needs information on additional computer matches that have either been suggested relevant to the FSP (matches against electronic benefit transfer transaction data, biometrics identification systems, prison records, and social security check records) or have been mandated by PRWORA, such as new hires database. The cost of the project, conducted by Mathematica Research Policy, Inc., is $342,269 in FY 1998. Project staff have developed a draft survey instrument and are preparing for a small pre-test. Survey work will occur in 2000. The expected date of completion is March 2001.

The Evaluation of EBT Customer Service Waivers on Recipients

The objectives of this project are to:

- characterize client service problems associated with FSP electronic benefit transfer (EBT) system customer service waivers and identify how clients respond; and
- estimate the occurrence of client service problems associated with EBT customer service waivers.

Regulations governing implementation and operation of EBT systems include several customer service standards. As EBT has developed and expanded, FNS has allowed States to try alternative service policies via waivers. The principal waivers employed by States include: (1) training recipient by mail versus training in person; (2) PIN assignment versus PIN selection; and, (3) alternative procedures for card replacement. Approximately one-half of the States currently operating an EBT system have implemented some combination of the three principal waivers. While waivers have generally saved States money, there are reports by client advocate groups of instances in which some of the alternative policies create problems for some recipients, especially vulnerable ones like the elderly and the disabled. This project will provide the Department with an assessment of the extent to which EBT customer service waivers adversely affect client services, and particularly their effects on the vulnerable subgroups. A contract was awarded to Abt Associates, Inc., for a cost of $647,255 in FY 1998. The expected completion date is September 2000.

Nutrition and Health Outcomes of USDA Food and Nutrition Assistance Programs.

The objective of this study is to improve the understanding of effects that USDA's food and nutrition assistance programs have on food consumption, nutrient availability and intakes, dietary quality, nutritional status, and health outcomes. This study will produce a document which the USDA can use to: (1) answer questions concerning the diet, nutrition, and health impacts of USDA food and nutrition assistance programs; and (2) assess the state of scientific knowledge regarding the diet, nutrition, and health impacts of USDA food and nutrition assistance programs. A contract was awarded in FY 1998 to Abt Associates, Inc., for $526,358. The expected completion date is May 2000.

Food Stamp Program Microsimulation and Related Analysis

The objectives of this project are to provide the simulations and related technical expertise needed to estimate the impact of proposed changes to the FSP. Other objectives include: maintaining and improving microsimulation capabilities, preparing databases, and conducting supporting research. Reports will be provided in such areas as FSP eligibility participation and the poverty population. The cost of the project, which is conducted by Mathematica Policy Research, Inc., is $778,628 in FY 1998. The project's completion is pending the release of Wave 6 from the 1996 Survey of Income and Program Participation Panel.

WIC General Analysis Project (GAP)

This work researches and analyzes WIC to support program and policy decisions including research on:

- estimates of WIC eligibility;
- changes in WIC participant characteristics over time; and
- nutrient, health risk, and demographic characteristics of WIC participants and eligible nonparticipants.

In 1984 and biennially since 1988, the USDA conducted studies of WIC participant and program characteristics. These studies provide descriptive statistics on all categories of WIC participants, including children. The USDA is interested in conducting special studies utilizing the data on American Indians, migrants, teenage mothers, overweight children and other policy-relevant subgroups. FNS prepared reports which include a profile of the sociodemographic characteristics, risk profiles, and health care usage patterns. The data used for these reports primarily came from existing data in the biennial participant characteristics surveys, with a special focus on 1996. The completion date for this project was March 31, 1999.

Another project looks at the fastest growing segment of the WIC population, children 1-4 years of age. In FY 1997, WIC served an average monthly participation of 7.4 million individuals, including 3.8 million children ages 1 to 4 years of age. Because large-scale nationally representative studies of WIC's impact are not feasible at this time, FNS intends to expand the body of research which describes the experiences of WIC and non-WIC children. The report included descriptive information obtained from the Third National Health and Nutrition Examination Survey (NHANES III). The completion date for this project was June 1, 1999.

The third project deals with estimating funding levels. WIC is a discretionary program, in the appropriations process, and thus participation is limited by annual funding levels. To assist in determining appropriate funding levels, policymakers have long been interested in estimates of the number of eligible persons, as well as estimates of the number of persons who are likely to participate if funds were available. This project reviewed and summarized the approaches which have been taken by the USDA and others to estimate eligible persons for and likely to participate in the WIC program, identify key data and analytical issues related to WIC eligible estimation, and point out issues for further review. The completion date was February 1999.

A final report Estimating the Number of People Eligible for WIC and the Full-Funding Participation Rate: A Review of the Issues was completed February 1999. Draft reports on the other two topics have been prepared and are being revised. ERS serves on technical review panels, reviews project and analysis plans, reviews draft and final deliverables for approval and acceptance, and reviews for clearance all final reports before Departmental release. ERS provided FNS $560,000 in FY 1998, inclusive of $60,000 for dissemination of information. The project is expected to be completed in September, 2001.

Child Nutrition Analysis Project (CNAP)

This work conducts research and analysis of the USDA's child nutrition programs. It supports program and policy decisions including research on (1) food and nutrient intake of school-age children and (2) the contribution of child nutrition programs to food and nutrient intakes. CACFP provides reimbursements for snacks and meals served in child day care and adult day care facilities that participate. Not all day care facilities are eligible to participate and not all eligible facilities participate in CACFP. FNS needs descriptive information on existing child care facilities participating in the CACFP, expansion potential of CACFP, and potential eligible CACFP, given a program rule change.

Extant data are being collected to provide the most current descriptive profile of child care centers and children participating in those centers. Data will be collected through a search of all national and sub-national sources of reliable data that provide descriptive characteristics of child care centers. The expected completion date of this work, conducted by RAND, is fourth-quarter 2000.

States are required to perform nutritional reviews in which they conduct nutritional analyses to determine whether school meals are meeting the established nutrition standards. The School Meals Initiative for Healthy Children (SMI) updated the nutritional requirements that school meals must meet in order to qualify for Federal reimbursement. States are allowed to use any valid nutritional analysis method and record-keeping system they choose. States are not required to report nutritional monitoring data to FNS and thus the Department does not know the quality or availability of the data. The SMI requires States to have reviewed nutritional monitoring of State food authorities in 5 years (by the end of school year 2001-2002). However, not every State has started performing reviews, and it is unlikely that States will be done in this time frame. Thus FNS has proposed a rule (Any Reasonable Means rule) that would extend the current 5

years review to 7 years. A survey is being conducted of State agencies to assess what SMI monitoring data States possess, whether this data can tell FNS how many SMI reviews required no corrective action to meet the new guidelines, and, if States possess adequate data, how easily can FNS obtain it. Research will identify needed changes to state record-keeping procedures and reporting systems that will allow FNS to better monitor corrective action. The expected completion date of this work, conducted by RAND, is fourth-quarter 2000.

The National School Lunch Program (NSLP) and SBP are intended to promote good nutrition among children, and meals must meet specific requirements (defined in either food components or nutrients) to be served under these programs. Over time, many factors are likely to have influenced the contribution school meals make in the diets of school- aged children. These include growth in program participation, changes in the nutritional requirements associated with the programs, and overall changes in the dietary patterns of the population over time. The Continuing Survey of Food Intake by Individuals (CSFII) is being used to analyze the food and nutrient intake and change in intakes over time of school-aged children, relative to various dietary standards. The expected completion date of this work, conducted by Mathematica Policy Research, Inc., is fourth-quarter 2000.

The project cost is $460,000 in FY 1998.

Continuing Survey of Food Intake by Individuals (CSFII)

This project improves estimates of low-income households' food consumption in the United States by increasing the sample size of low-income individuals in the USDA's Continuing Survey of Food Intake by Individuals (CSFII). It developed and modified survey questions that measure food consumption by low-income individuals in the United States.

The CSFII has been conducted three times: 1985-86 (2 years); 1989-91 (3 years); and 1994-96 (3 years). The survey design is a multistage, stratified area probability sample. The 1994-96 CSFII is popularly known as "What We Eat in America." The survey has targeted different populations in different years. The earlier survey included two separate samples: households at all incomes and households with incomes at or below 130 percent of the poverty thresholds. Detailed data are reported on the kinds and amounts of foods eaten at home and away, and estimates of food-based nutrients ingested by individuals are derived from data developed by the Nutrient Data Laboratory, Agricultural Research Service (ARS). Funding supports a 50 percent increase in the low-income sample of the 1999-2002 CSFII. The sample of low-income household respondents is raised from 4,140 to 6,120. The enhanced low-income sample will provide timely information on low-income diets and diets of other population groups of concern and indicate changes in diets from previous surveys. ERS contributed $1,250,000 in FY 1998 in support of this project.

Farm Operator Households

Mr. Skeen: Please update the table that appears on page 810 of last year's hearing record that shows the level and sources of income from farm operator households.

Response: The table has been updated. According to the Agricultural Resource Management Study (ARMS), the 1998 average household income for a farm operators household was $59,700, which is higher than the average for all U.S. households ($51,900). About 88 percent of the average farm operator's household income came from off-farm sources, and many operators spent the majority of their work efforts in occupations other than farming. Off-farm income includes wages and salaries from an off-farm job, net income from an off-farm business, interest and dividends, and Social Security. Like other U.S. households, farm households receive income from a variety of sources.

There is substantial variation among farm households in their dependence on farming. Households operating very small farms typically depend much less on farm income than households operating larger farms. For example, farms with sales less than $10,000 actually lost an average of $5,700 per farm from farming. Fortunately, their off-farm income averaged $56,900. Most operators of farms with sales less than $10,000 reported that they had a nonfarm occupation (58 percent) or that they were retired (25 percent). Households operating farms with sales between $10,000 and $49,999 also lost money farming, but not as much. In contrast, the share of income from farming for households operating larger farms ranged from 8 percent for households with sales between $50,000 and $99,999 to 84 percent for households with sales of $500,000 or more.

Average income to farm operator households, 1994-2000 1/

	1995	1996	1997	1998	1999F	2000F
	Dollars per farm					
Net cash farm business income 2/	11,218	13,502	12,676	14,357	n.a.	n.a.
Less depreciation 3/	6,795	6,906	6,578	7,409	n.a.	n.a.
Less wages paid to operator 4/	522	531	513	637	n.a.	n.a.
Less farmland rental income 5/	769	672	568	543	n.a.	n.a.
Less adjusted farm business income due to other household(s) 6/	649	1,094	1,505	1,332	n.a.	n.a.
	Dollars per farm operator household					
Equals adjusted farm business income	2,484	4,300	3,513	4,436	n.a.	n.a.
Plus wages paid to operator	522	531	513	673	n.a.	n.a.
Plus net income from farmland rental 7/	1,053	1,178	945	868	n.a.	n.a.
Equals farm self-employment income	4,059	6,009	4,971	5,941	n.a.	n.a.
Plus other farm-related earnings 8/	661	1,898	1,234	1,165	n.a.	n.a.
Equals earnings of the operator household from farming activities	4,720	7,906	6,205	7,106	6,496	2,975
Plus earnings of the operator household from off-farm sources 9/	39,671	42,455	46,358	52,628	54,443	56,375
Equals average farm operator household income comparable to U.S. average household income, as measured by the CPS	44,392	50,361	52,562	59,734	60,912	59,350

	Dollars per U.S. household					
U.S. average household income 10/	44,938	47,123	49,692	51,855	n.a.	n.a.
Percent						
Average farm operator household income as percent of U.S. average household income	98.8	106.9	105.3	115.2	n.a.	n.a.
Average operator household earnings from farming activities as percent of average operator household income	10.6	15.7	11.8	11.9	n.a.	n.a.

F = forecast. n.a. = not available.
1/ This table derives farm operator household income estimates from the Agricultural Resource Management Study (ARMS) that are consistent with Current Population Survey (CPS) methodology. The CPS, conducted by the Census Bureau, is the source of official U.S. household income statistics. The CPS defines income to include any income received as cash. The CPS definition departs from a strictly cash concept by including depreciation as an expense that farm operators and other self-employed people subtract from gross receipts when reporting net cash income.
2/ A component of farm sector income. Excludes income of contractors and landlords as well as the income of farms organized as nonfamily corporations or cooperatives and farms run by a hired manager. Includes the income of farms organized as proprietorships, partnerships, and family corporations.
3/ Consistent with the CPS definition of self-employment income, reported depreciation expenses are subtracted from net cash income. The ARMS collects farm business depreciation used for tax purposes.
4/ Wages paid to the operator are subtracted here because they are not shared among other households that have claims on farm business income. These wages are added to the operator household's adjusted farm business income to obtain farm self-employment income.
5/ Gross rental income is subtracted here because net rental income from the farm operation is added below to income received by the household.
6/ More than one household may have a claim on the income of a farm business. On average, 1.1 households share the income of a farm business.
7/ Includes net rental income from the farm business. Also includes net rental income from farmland held by household members that is not part of the farm business.
8/ Wages paid to other operator household members by the farm business and net income from a farm business other than the one being surveyed. Beginning in 1996, also includes the value of commodities provided to household members for farm work.
9/ Wages, salaries, net income from nonfarm businesses, interest, dividends, transfer payments, etc.
10/ From the CPS.
Sources: U.S. Dept. of Agriculture, Economic Research Service, 1995 Farm Costs and Returns Survey (FCRS), and 1996, 1997, and 1999 Agricultural Resource Management Study (ARMS) for farm operator household data. U.S. Dept. of Commerce, Bureau of the Census, Current Population Survey (CPS), for U.S. average household income.

For information on household income contact: Bob Hoppe (202) 694-5572. Email rhoppe@econ.ag.gov.

Mr. Skeen: Do you have the report on the use of alternative pest management practices from the 1996-97 Agricultural Resource and Management survey now available? If so please provide a copy for the record.

Response: Yes, the report, *Pest Management in U.S. Agriculture* (Agricultural Handbook No 717), was published in August 1999 . A copy is attached.

[Clerk's note: The attachments were deemed too lengthy for printing and have been retained in Committee files.]

Mr. Skeen: Update the Committee on the progress the ERS has made in linking production and input data to National Resource Inventory data collected by NRCS.

Response: ERS has developed a procedure to link environmental indicators developed from the National Resources Inventory (NRI) to the Agricultural Resources Management Study (ARMS) database. The resulting database can provide approximate information on resource conditions and problems that exist in various farm types that can be defined from the ARMS survey. For example, the combined database can be used to estimate average soil erosion rates by ERS Farm Typology, Commodity (farms by SIC classification), and other farm financial or farm type criteria. The database can also be used to estimate how targeting land in conservation and environmental programs may affect the types of farms that are eligible for (or more likely to

receive) cost-share or other payments. The link is made through geographic proximity using GIS techniques and does not provide precise information on environmental and resource conditions on farms surveyed in ARMS. However, it is a useful analysis tool at the national and regional level. At present, only a handful of indicators have been linked to ARMS to provide a demonstration of potential capabilities to NRCS and USDA leadership (Deputy Secretary Rominger, Under Secretary Lyons, and NRCS Chief Reed). Additional indicators are currently under development.

Mr. Skeen: Please provide an update of coordinated efforts that ERS has with any USDA agencies that will help resolve resource and agricultural production issues.

Response: ERS works closely with several other USDA agencies. We stand ready to provide service when requested. These activities include reviewing proposals submitted to the agency, participating in working groups, and conducting research and data development, among others. For example:

- ERS is an active participant in the USDA Conservation Reserve Program (CRP) Working Group that evaluates bids by producers to enroll land in the CRP. ERS contributes analysis to recommendations to the Secretary on the set of offers and the amount of acreage to enroll in the program. This helps the program operate in the most cost-effective manner possible.

- ERS participates in the USDA Biotechnology Coordinating Council, contributing analysis and data on adoption and impacts of genetically engineered seed and livestock technology.

- ERS contributes to evaluation of State Conservation Reserve Enhancement Program (CREP) proposals to enhance program cost-effectiveness.

- ERS cooperated with the Natural Resources Conservation Service (NRCS) to develop a model that provides a consistent set of manure nutrient estimates from individual data records of the Census of Agriculture collected by the National Agricultural Statistics Service (NASS). By employing a coordinated modeling effort, NRCS and ERS are using consistent estimates that are improved relative to each Agency undertaking the modeling on their own.

- ERS has been working as part of the NRCS issues team developing background and recommendations for the proposed Conservation Security Program (CSP). The issues team is providing options on a range of program implementation issues for NRCS and USDA leadership. In conjunction with participation on the NRCS issues team, ERS has provided significant analytical support for CSP development using the ARMS survey data. Additional support will be provided using our database of NRI-based environmental indicators linked to the ARMS survey.

- ERS cooperated with the University of Florida and the National Center for Food and Agricultural Policy to examine the economic tradeoffs involved in phasing out methyl bromide. The USDA Agricultural Research Service (ARS) provided funding as well as technical input for this research. Important information was solicited from USDA, EPA,

State governments, universities, and representatives of commodity groups, environmental groups, and the input industry. USDA agencies that provided input to or reviewed the reports by the cooperators and ERS's synthesis report include ARS; the Animal and Plant Health Inspection Service; the Cooperative State Research, Education, and Extension Service; the Forest Service; and the Office of the Chief Economist.

- ERS participates in the Coordinating Committee of the USDA Working Group on Water Quality. This group provides guidance on water quality-related issues to the Department and its agencies. Along with NASS, ERS has been responsible for the Agricultural Chemical Use Surveys, which cover the major field crops, vegetables, fruits, and nuts and are conducted annually. These surveys obtain data on the chemicals being used on major crops, the amounts being applied, and application methods.

- ERS participated on USDA and inter-departmental working groups developing the rules and regulations for the Environmental Quality Incentive Program (EQIP), CRP, and other programs that provide water quality benefits, including approaches for prioritizing program activities to maximize cost-effectiveness. These efforts involved coordination with program agencies implementing the rules.

- ERS was involved in the development of the Vice President's Water Quality Action Plan, along with representatives from other USDA and Federal agencies. ERS is represented on the USDA Clean Water Action Plan (CWAP) Principles Group, which provides guidance to the Department and its agencies on CWAP issues.

Mr. Skeen: How much did your agency contribute to the National Agricultural Pesticide Impact Assessment Program in fiscal year 1999, and what do you anticipate contributing in fiscal year 2000 and 2001? What is the value to ERS of contributing to this program?

Response: ERS did not contribute to the National Agricultural Pesticide Impact Assessment Program in fiscal year 1999 and does not anticipate contributing to the program in fiscal year 2000 and 2001.

Mr. Skeen: Please update the table that appears on page 813 of last year's hearing record showing data purchases, to include fiscal year 1999 actuals and estimates for fiscal years 2000 and 2001.

Response: Following is the updated table that shows our data acquisition purchases.

Data Acquisition Purchases

1989	$3,527
1990	4,806
1991	5,960
1992	5,453
1993	6,237
1994	3,011
1995	2,819
1996	2,844
1997	4,279
1998	4,427
1999	3,944
2000 estimate	4,000
2001 estimate	4,000

Mr. Skeen: Provide a detailed table of your budget request to the Secretary, the Secretary's request to OMB, and OMB's allowance.

Response: Below is a table that shows the ERS budget request to the Secretary, the Secretary's request to OMB, and OMB's allowance.

Economic Research Service

Item	Agency Request to the Secretary	Secretary's Request to OMB	OMB Allowance
FY 2000 Enacted	65,419,000	65,419,000	65,419,000
Changes to enacted:			
Pay Costs	1,675,000	1,675,000	0
Inflation	295,000	0	0
Structural Change	2,000,000	2,000,000	1,056,000
Global Research and Outreach	11,500,000	1,000,000	500,000
Carbon Sequestration	0	700,000	700,000
Farm Risk Management	3,191,000	950,000	0
Small Farms Data Collection & Analysis	1,500,000	1,250,000	0
Food Assistance and Program Evaluation	5,305,000	-12,195,000	-12,195,000
Rescission due to P.L. 106-113			-56,000
TOTAL	90,885,000	60,799,000	55,424,000

Mr. Skeen: Please bring the Committee up to date on the Market & Trade Economics Division's report on NAFTA.

Response: The USDA *1999 NAFTA Report* was transmitted to Congress in the early summer of 1999. The first part of the report was published in August 1999 and the second part, comprising detailed commodity analysis, is scheduled to be published in early Spring 2000. ERS's research program for 2000 offers comprehensive analysis on NAFTA's impact on commodity markets, investment, and employment. In addition, ERS work plans include research on the Integration of the North American Economies (United States, Canada, and Mexico).

Mr. Skeen: Please update the table that appears on page 816 of last year's hearing record showing the distribution of Nonmetro Nonfarm Earnings and Jobs by Industry for the most recent data that is available.

Response: I am submitting an update of the table with the most recent data showing the distribution of all nonmetro earnings and jobs, both farm and nonfarm by industry.

The information follows:

Nonmetro Earnings and Jobs by Industry, 1997

	Share of Earnings (percent)	Share of Jobs (percent)	Job Growth 1989-97 (percent)
Total nonmetro	100.0	100.0	15.6
Farm	4.2	6.5	-7.9
Nonfarm	95.8	93.5	17.8
Agricultural services, forestry, and fishing	1.0	1.8	42.9
Mining	2.3	1.2	-20.5
Construction	6.4	5.6	26.4
Manufacturing	23.0	16.0	4.7
Transportation and public utilities	6.3	4.2	18.6
Wholesale trade	4.0	3.1	11.0
Retail trade	10.6	17.4	23.3
Finance, insurance, and real estate	3.6	4.7	20.1
Services	19.9	23.6	30.6
Government	18.6	15.8	9.7

Source: Calculated by ERS using data from the Bureau of Economic Analysis.

Mr. Skeen: What is the total amount the agency spent on global climate change in fiscal year 1999 and estimates for fiscal year 2000 and 2001?

Response: The Economic Research Service spent $800,000 in fiscal year 1999 and estimates spending at $800,000 for fiscal year 2000 and $1.5 million for fiscal year 2001.

Mr. Skeen: Are there any plans for ERS to conduct any research or studies in connection with the Kyoto agreement on global warming in fiscal year 2000 or 2001?

Response: The ERS Global Resources and International Environmental Issues program addresses how agricultural activities influence--and are influenced by--global changes in land, water, climatic, and biological resources. It also investigates how proposed international agreements and proposed domestic policies for protecting global resources and the environment would affect agricultural productivity and location, the distribution of comparative trade advantage and global food security. In this context, a portion of the research in this program will examine the costs to U.S. agriculture from various greenhouse gas emission reduction strategies and target levels, and the benefits to U.S. agriculture from various carbon sequestration programs and target levels. Project staff are collaborating with other USDA and university researchers in analyses of the impacts on U.S. agriculture and the amount of carbon that would be sequestered under various possible carbon sinks programs.

Mr. Skeen: Update the table that appears on page 834 of last year's hearing record showing the breakout of budget and staff years of ERS offices to include fiscal year 1999.

Response: Below is a table that shows the budget and staff year breakout of ERS offices. In FY 1999, the Office of Energy was transferred to the Office of the Chief Economist.

ERS OFFICES/DIVISIONS BUDGET AND STAFF-YEARS, 1998-00
(Dollars in Thousands)

Offices/Divisions	1998		1999		2000	
	Staff-Budget	Years	Staff-Budget	Years	Staff-Budget	Years
Office of the Administrator	1,360	13	1,598	13	1,600	13
Information Services Div.	8,745	96	8,655	90	8,700	90
Market & Trade Economics Div.	15,374	150	15,265	146	15,300	146
Food & Rural Economics Div.	29,592	111	22,100	115	25,063	115
Resources Economics Div.	12,890	119	12,106	114	12,200	114
Office of Energy	918	6				
Administrative & Financial Mgmt	2,725	36	2,764	33	2,500	33
TOTAL	71,604	531	62,488	511	5,363	511

Mr. Skeen: What were the most significant findings from the ***21st Family Farm Report*** as they relate to the future of the family farm?

Response: Most U.S. farms today are family farms, and we expect this to remain true in the future. However, production will likely become more concentrated on the larger family farms.

The number of family farms will continue to drop, but at a slower rate than from the early 1940's through the early 1970's, due to the prevalence of off-farm income. Complex business arrangements--even for sole proprietorships--will continue and likely expand.

Family farms include farms organized as proprietorships, partnerships, and family corporations (figure 1). Family farms exclude farms organized as nonfamily corporations or cooperatives, as well as farms with hired managers. Family farms are closely held (legally controlled) by their operator and the operator's household. Using this definition, about 98 percent of U.S. farms are family farms.

Family farms are diverse, and more than 90 percent have sales less than $250,000, which the National Commission on Small Farms used to define small farms. Households operating family farms, particularly small family farms, depend heavily on off-farm income. For example, households with retirement or residential farms rely on off-farm income for virtually all their income, on average. And, over half of household income comes from off-farm sources for households operating small farms with sales between $100,000 and $249,999.

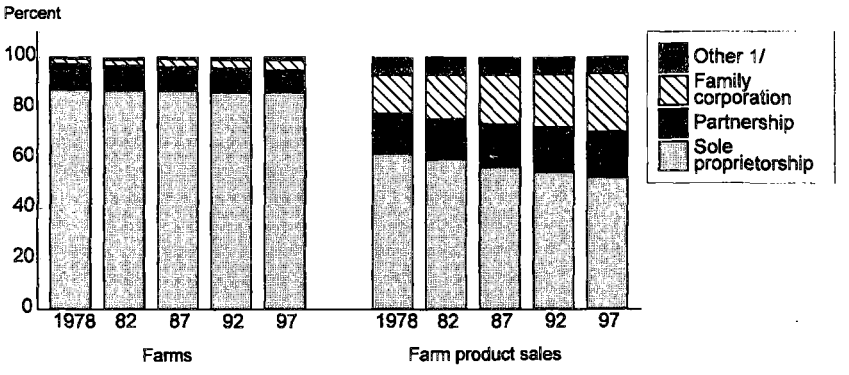
Although most U.S. farms are classified as small, agricultural production is highly concentrated among large family farms (sales between $250,000 and $499,999) and very large family farms (sales of $500,000 or more). These two groups together make up 8 percent of all farms, but account for 57 percent of U.S. production of agricultural products.

Nevertheless, small farms collectively held 70 percent of farm assets, including 75 percent of the land. As custodians and managers of the bulk of farm assets, including land, small farms will continue to play a major role in natural resource and environmental policy. For example, retirement farms alone account for 24 percent of the land in the Conservation Reserve Program (CRP).

Despite popular concern, the share of farms and agricultural sales accounted for by nonfamily corporations has been stable for decades. Legal organization alone, however, does not capture the use of various formal and informal business arrangements to gain access to technology, markets, equity capital, or other inputs. More commonly used arrangements include marketing and production contracts, joint ventures, strategic alliances, leases, and a variety of agreements and licenses. Even sole proprietorships have these business linkages.

Figure 1

Distribution of farms and farm product sales, by legal organization, 1978-97
Most farms are sole proprietorships



1/Includes nonfamily corporations, cooperatives, estates or trusts, and institutional farms.

Source: Census of Agriculture, various years.

Mr. Skeen: Did you eliminate any ongoing services during fiscal year 1999? Do you plan to eliminate any ongoing services during fiscal years 2000 or 2001?

Response: No, ERS did not eliminate any ongoing services in fiscal year 1999 and does not plan to eliminate any ongoing services during fiscal years 2000 and 2001.

Mr. Skeen: Did you discontinue any reports during fiscal year 1999? Do you plan to discontinue any reports in fiscal years 2000 or 2001? If so, please provide a list of these reports for the record, showing the frequency of the report, the total number of copies published each year, and the reason you are discontinuing the report.

Response: In fiscal year 2000, ERS has changed the name of its magazine *Rural Development Perspectives* to *Rural America*. This name change is accompanied by an updated look for the magazine. In fiscal year 2001, ERS plans to discontinue its magazine *Rural Conditions and Trends*. *Rural Conditions and Trends* is published three times a year. ERS printed 1,800 copies. Information on current demographic and economic trends in rural America formerly published in *Rural Conditions and Trends*, will be included in *Rural America*. This change is part of ERS's continuing effort to update and streamline its portfolio of products as we adjust to an expanding workload with fewer staff.

Foreign Agricultural Trade of the United States, Fiscal Year Supplement was discontinued in 1999. This was done to save both money and staff time and to increase timeliness of data released through a shift to Internet distribution. ERS printed 1,000 copies of the last report in 1998. We continue to publish a calendar year edition annually, and both fiscal and calendar year data are available to users on the ERS web site.

Also, during fiscal year 1999 the Resource Economics Division discontinued two reports:

Ownership of U.S. Agricultural Land, an annual report required under the Agricultural Foreign Investment Disclosure Act of 1978, was discontinued pursuant to The Federal Reports Elimination Act of 1998. We published 600 copies of the final issue of this report.

The Farm Business Economics Report, an annual report, was discontinued because it duplicated information made available earlier on the ERS website. 1,900 copies of the final issue were published.

No additional reports are scheduled to be eliminated in FY 2000 or 2001.

Mr. Skeen: To what extent did the ERS use its early-out authority in fiscal year 1999?

Response: In fiscal year 1999, five employees were given early-outs.

Mr. Skeen: Has ERS used its early-out authority in fiscal year 2000?

Response: ERS did not request early-out authority in fiscal year 2000.

Mr. Skeen: To what extent did the ERS use its buy-out authority in fiscal year 1999?

Response: ERS did not request buy-out authority in fiscal year 1999.

Mr. Skeen: Has ERS used its buy-out authority in fiscal year 2000?

Response: ERS did not request buy-out authority for fiscal year 2000, and does not expect to offer buy-outs this year.

Mr. Skeen: Please provide the Committee with an update on the cost containment study referred to in House Report 105-588 as it relates to the WIC program.

Response: ERS awarded a contract to Abt Associates Inc. in September 1999 to conduct the study referred to in House Report 105-588. The study is assessing the effects of cost-containment practices by State agencies on: (1) program participation; (2) access and availability of prescribed foods; (3) voucher redemption rates and actual food selections by participants; (4) participants on special diets or specific food allergies; (5) participant use and satisfaction of prescribed foods; (6) achievement of positive health outcomes; and (7) program costs.

The study is being conducted in six States selected to represent the three primary cost-containment practices: (1) vendor selection restrictions; (2) item selection restrictions; and (3) manufacturer rebate practices. Infant formula rebate practices are specifically excluded from this study. The research is drawing on a number of data sources, including: State WIC information systems, a survey of WIC participants, focus groups with WIC dropouts, a survey of WIC food availability and prices, supermarket scanner data, and interviews with State and local WIC staff. The final report to Congress is schedule for delivery to the Committee in September 2002.

Mr. Skeen: How much of the $1.5 million has ERS obligated as of March 8, 2000?

Response: A fixed-price contract was awarded to Abt Associates, Inc. in fiscal year 1999 for a base cost of $1,099,293. As of March 8, 2000, this is the total amount obligated. The contract contains an analysis option to begin within 24 months after the initial contract in the amount of $376,937. ERS anticipates exercising the option in FY 2000. The total cost of the base contract and option is $1,476,230.

Mr. Skeen: Please provide the committee with an update on Estimating the Benefits of Food Safety.

Response: Food safety continues to be an important research topic for ERS. ERS continued its collaboration with FSIS and the Centers for Disease Control and Prevention under the National Food Safety Initiative. ERS used data provided by the CDC from the "FoodNet" active surveillance system to update our estimates of the costs of food borne disease and the benefits of improving food safety. Using new, updated figures on the number of illnesses, hospitalizations,

and deaths associated with major food borne pathogens, ERS estimates the annual cost of these food borne diseases to be from $9.2 to $10.2 billion. ERS also collaborated with CDC staff to refine and update our methodology for measuring the cost of food borne disease, with an emphasis on diseases caused by *Salmonella*. These cost figures are being used to update our estimates of the benefits of reducing foodborne illness.

One of the critical issues in food safety economics research is how to place a dollar value on preventing premature death from unsafe food. In FY 1999, ERS released a report on alternatives for valuing health risks. "Assigning Values to Life: Comparing Methods for Valuing Health Risks" examined five approaches economists and health policy analysts have developed for evaluating policy affecting health and safety. The authors examined the theoretical basis and empirical application of each approach and investigate the influence that assumptions embedded in each approach have on policy guidance. The report suggests the appropriate use of each approach. ERS has planned a conference for September, 2000 to build on this work. "Valuing the Health Benefits of Food Safety" is co-sponsored by ERS, the Food Safety and Inspection Service, the Food and Drug Administration, the Environmental Protection Agency, and several Land Grant universities. The goal of this conference is to reach a consensus among economists about the best methods to use for valuing the benefits of food safety, especially when conducting cost-benefit analyses of food safety policies and programs.

ERS has also established a new extramural research program to measure the benefits of safer food. With an FY 1999 appropriation of $453,000, ERS put in place a competitive selection process to award funding for cooperative agreements in food safety research. Two competitively selected grants were awarded to Harvard University and the University of Wyoming, to develop national estimates of the benefits of improving the safety of the Nation's food supply: "Estimating Consumer Benefits of Improving Food Safety," Jason Shogren, University of Wyoming ($150,150), and "Valuing Reductions in Foodborne Risk Associated with Bacterial Pathogens," James Hammitt and Kip Viscusi, Harvard University ($141,428). These research projects will apply state-of-the-art valuation methodologies to measure consumer willingness to pay for reductions in food safety risk from microbial pathogens. They are developing estimates of the consumers' "willingness to pay" for safer food using such techniques as contingent valuation, experimental auction markets, and retail sales experiments.

Mr. Skeen: Provide an object class breakout for the $453,000 increase ERS is requesting for economic analysis in food safety risk assessment.

Response: ERS did not request an increase of $453,000 for the 2001 budget. The object class breakout for the $453,000 increase in FY 2000 that was added to the base level for economic analysis in food safety risk assessment in FY 2001 is as follows:

Object Class	Dollars
11/12 Salaries and Benefits	$453,000

Mr. Skeen: Has ERS finalized a fiscal year 2000 funding and priority list for studies and evaluations of child nutrition, WIC, and food stamps? If so, please provide a copy for the record.

Response: Attached is a copy of the fiscal year 2000 research plan for child nutrition, WIC, and food stamps.

Mr. Skeen: How much of the fiscal year 2000 studies and evaluations funds will go to vendors or contractors outside USDA?

Response: In fiscal year 2000, ERS anticipates obligating $ 4.387 million directly in contracts to vendors or contractors outside USDA, plus $2.311 million in partnership with other Federal agencies outside USDA and $3.540 million in competitive grants and cooperative agreements. Additionally, $0.255 million is directed into the Small Business Innovation Research (SBIR) Program and $0.25 million is going to the National Academy of Sciences Study of WIC eligibility through an agreement with the Food and Nutrition Service.

Mr. Skeen: Please provide an object class breakout for the studies and evaluations for fiscal years 1999 and 2000.

3/15/00

Object Class	Description	FY 1999 (dollars)	FY 2000 1/ (dollars)
11	Salaries	472,427	545,000
12	Benefits	101,921	205,000
21	Travel	22,341	70,000
22-31, 2523	Supplies, equipment, printing, training, and related administrative costs	22,567	65,000
2510	Interagency Agreements	1,756,460	3,014,200
2540	Contracts	4,301,843	4,387,177
2554	Cooperative Agreements	1,318,954	1,603,623
4120	Grants	2,198,487	1,305,000
Total		10,195,000	11,195,000

1/ Planned spending levels.

Mr. Skeen: Did any USDA agencies or entities receive any funding from ERS for studies and evaluations in fiscal year 1999? If so, which USDA agencies, and how much did they receive?

Response: The ERS Food Assistance and Nutrition Research Program supported three projects at other USDA agencies. The USDA Graduate School received $127,032 to provide support for the Community Food Security Assessment Conference, of which $50,000 was reimbursed by Cooperative State Research, Education, and Extension Services for jointly sponsored conference activities. In addition, the Agricultural Research Service, USDA, received $20,000 to provide support for the Food and Nutrition Summer Institute, which was held in Baltimore, Maryland on July 21-24, 1999. Finally, the National Agricultural Library, Agricultural Research Service, USDA, received $200,000 to provide support for NAL's systematic storing and dissemination of information on USDA's food assistance programs, and for hosting a web site and list server.

Mr. Skeen: Will any USDA agencies or entities receive any funding from ERS for studies and evaluations in fiscal year 2000? If so, which USDA agencies and how much will they receive?

Response: The Economic Research Service plans to continue its support of the Food and Nutrition Summer Institute and the Food and Nutrition Information Center, National Agriculture Library. As in fiscal year 1999, $20,000 will be provided in fiscal year 2000 to the Agricultural Research Service, USDA, and $202,000 will be provided to the National Agricultural Library. In addition, we plan to provide $250,000 to the Food and Nutrition Service to support a contract with the National Academy of Sciences study of WIC eligibility. We also plan to provide $30,000 through an agreement with the Agricultural Research Service to support a World Health Organization (WHO) conference on interventions to prevent low birth weight. The total amount planned for these activities is $502,000.

Mr. Skeen: Has ERS transferred $1,000,000 to the Food and Nutrition Service Food Program Administration Account as provided in the fiscal Year 2000 appropriation bill.

Response: Yes. The Department prepared and sent to the U.S. Treasury an SF-1151, Nonexpenditure Transfer Authorization in February, 2000 to reapportion the appropriated funds from ERS to the Food and Nutrition Service. The document was processed by the Treasury Department on March 6, 2000.

Mr. Skeen: Please provide for the record, a table on the studies and evaluations you are conducting directly related to the nation's domestic food and nutrition assistance programs, including a short description of each project, the fiscal year in which each was funded, the total funding amount for each project, and the projected completion date for each project.

Response: The attached report, **Food Assistance and Nutrition Research Program Final Report: Fiscal 1999**, contains the requested information in tables 1 and 2 on pages 17-23 and pages 24-30, respectively. More detailed information on the individual studies is contained in response to question #4.



Food Assistance and Nutrition Research Program

Economic Research Service, USDA

RESEARCH PRIORITIES: FISCAL YEAR 2000
PROGRAM OVERVIEW

REACHING UNDERSERVED POPULATIONS
- Reaching the Elderly
- Reaching the Working Poor
- Reaching Female Teens

FOOD PROGRAMS AS A SAFETY NET AND CLIENT WELL-BEING
- Welfare Devolution and Urban Change in Four U.S. Cities
- Program Access and Declining FSP Participation
- Assessing Medicaid and Food Stamp Program Access and Participation
- Nutrition and Health Outcomes of USDA Food and Nutrition Assistance Programs
- Assessing Multiple Food Assistance Program Participation
- Understanding Causes and Consequences of Food Insecurity
- Coping With Limited Resources
- A Study of U.S. Emergency Food Assistance System: Provider and Recipient Characteristics

CHILD NUTRITION
- WIC Cost Containment Practices (Legislatively mandated)
- Expert Review of WIC Estimates
- Direct Certification and National School Lunch Program Integrity
- Child and Adult Care Food Program (CACFP) Cost Reimbursement Study
- Impact of School Lunch Environment and Program Participation
- Reducing the Prevalence of Obesity among WIC Children
- Mothers' Work, Time Constraints, and Child Nutrition
- Research on Breastfed Infants' Growth

BEHAVIORAL NUTRITION
- Economics of Food Choices
- Social Marketing and Market Segmentation Research
- Eating Patterns, Dietary Quality, and Obesity
- Development of Obesity, Food Insecurity, and Food Assistance

ENHANCED FOOD ASSISTANCE RESEARCH DATA
- Food Security: Current Population Survey Supplement, September 2000
- Early Childhood Longitudinal Surveys
- National Health and Nutrition Examination Survey (NHANES-IV)
- Enhancing Food Assistance Program Data

RESEARCH INNOVATION, INFRASTRUCTURE, AND OUTREACH
- Small Grants Program for Innovative Research and Outreach
- Food and Nutrition Information Center, National Agricultural Library
- Food and Nutrition Summer Institute

ECONOMIC RESEARCH SERVICE
FOOD ASSISTANCE AND NUTRITION RESEARCH PROGRAM
RESEARCH PRIORITIES FOR FY 2000

Reaching Underserved Populations

Reaching the Elderly

Elderly people make relatively little use of the Food Stamp Program (FSP) as measured by the percentage of eligible elderly people who participate in the program. Research is needed on the extent to which the nutrition needs of the elderly are underserved, and to identify not only the determinants that contribute to their low participation but also the relative importance of the various factors. In order to anticipate the unique needs of the aging "baby-boomers," studies that distinguish between the effects of aging per se and the effects of being a member of the cohort that is currently elderly are of special interest. Research is also needed on effective strategies for increasing elderly participation in the FSP such as streamlining the food stamp application process, shifting the form in which benefits are provided, and identifying alternative ways of assisting the elderly to access existing benefits. In addition, to develop outreach policies and materials for the elderly, basic social marketing research is needed on the elderly's perceptions, knowledge, attitudes, emotions, concerns, and motivations that pertain to program participation.

Grants/Cooperative Agreements

Reaching the Working Poor

The concurrent effects of a strong economy and welfare reform have increased the number of the working poor among food stamp clientele. Nevertheless, the percentage of eligible working poor households that participate in the FSP remains relatively low. Research is needed on participation and access issues for the working poor in general, and for nonparticipating working poor households in particular. What are their work and earnings patterns, FSP participation histories, family compositions, current benefit levels (perceived and potential), direct and indirect costs for FSP participation, time allocation issues, barriers to participation, food spending levels, and prevalence and severity of food insecurity? Research is also needed to evaluate the extent to which recent administrative actions taken in July 1999 have improved access for the working poor. These actions included new guidance making it easier for families to own a reliable car, new options allowing states to simplify income reporting rules, and a public outreach campaign to clarify the food stamps law's access requirements. FANRP has studies underway that examine local office practices; research on other program access issues for the working poor is welcomed.

Grants/Cooperative Agreements

Reaching Female Teens

Female teens have low participation rates in the School Breakfast Program (SBP) and the National School Lunch Program (NSLP). Teenage girls also tend to have high rates of eating disorders, to skip lunch, and to have low levels of calcium intake. Research is needed on strategies that would allow food assistance programs to better reach teenage girls, and the potential costs and nutritional benefits of such strategies. For example, modifications to the school meal programs, or improvements in how the benefits of the program are communicated, might increase the attractiveness of school meals among teenage girls, increase their participation rates, and yield nutritional benefits. Similarly, it has been suggested that the success of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in improving birth outcomes among pregnant women might be expanded if the program were to reach female teens (and other women) before they become pregnant.

Grants/Cooperative Agreements

Food Programs as a Safety Net and Client Well-being

Welfare Devolution and Urban Change in Four U.S. Cities

The Project on Devolution and Urban Change is a research study designed to understand how devolution and the Temporary Assistance to Needy Families (TANF) block grants play out in four large counties: Cuyahoga (Cleveland), Los Angeles, Miami-Dade, and Philadelphia. The project was initiated in 1997 by the Manpower Demonstration Research Corporation (MDRC) with private-sector funding, and will last approximately five years. Supplemental federal funding is being provided to expand analysis of specific issues of interest to the Department of Health and Human Service (DHHS) and USDA. This is the second year that FANRP has provided support to this project to augment analyses of the impacts of welfare reform on Food Stamp Program participation and household food security.

Interagency Agreement(DHHS/ASPE)

Program Access and Declining FSP Participation

The Food Stamp Program (FSP) caseload is declining at a faster rate than can be explained by changes in the economy or program eligibility, and there is growing concern about whether the food security safety net is serving all those in need. In fiscal 1999, a base contract was awarded to study changes in customer service delivery at local welfare offices including office operations, case management procedures, and welfare office workers' understanding of program changes. Project funding in fiscal 2000 will exercise a contract option to expand the analysis of these issues to include the perspective of eligible nonparticipants.

Contract Option

Assessing Medicaid and Food Stamp Program Access and Participation

Recent declines in cash-welfare caseloads have been accompanied by declines in Medicaid enrollment and Food Stamp Program (FSP) participation that are larger than expected. It is likely that many of the families leaving cash welfare remain eligible for these benefits, but do not take advantage them. Since health insurance coverage and food assistance benefits can serve as critical supports for families moving towards self-sufficiency, it is important that they be effectively used. This study, initiated in fiscal 1999, will review factors associated with the Medicaid enrollment and FSP participation declines; identify and highlight state or local policies and practices that offer potential to increase enrollment and participation among families with children, and recruit and assist states in demonstrating and evaluating the identified best practices. The Administration on Children and Families (ACF) is the lead agency in a multi-agency partnership with DHHS' Office of the Assistance Secretary for Planning and Evaluation (ASPE), USDA's Food and Nutrition Service (FNS), and ERS.

Interagency Agreement (DHHS/ACF)

Nutrition and Health Outcomes of USDA Food and Nutrition Assistance Programs

One of the major analytical challenges in implementing the outcome-based performance measures called for by the Government Performance and Results Act is determining when to attribute changes in outcome measures to program performance. In fiscal 1998, FANRP funded an extensive and authoritative review of the literature on the effects of USDA food assistance programs on such outcomes as food consumption, nutrient availability, nutrient intake, nutritional status, and various health outcomes. The study will also develop recommendations for analytical work that can be undertaken to improve our knowledge of the linkages among program performance, nutrition, and health outcomes. In fiscal 2000, FANRP will implement a contract option to conduct an extensive examination of diet and health outcomes using the National Health and Nutrition Examination Survey (NHANES).

Contract Option

Assessing Multiple Food Assistance Program Participation

Studies examining the feasibility of linking administrative data from the major USDA food assistance programs are of interest, as are more general proposals that advance the understanding of multiple-program participation, and adjunctive (cross-program) eligibility. Data for describing and understanding multiple program participation are sparse, but with recent expansion of case management information systems, introduction of point-of-sale software for school meals, and implementation of electronic benefit transfer systems for WIC and food stamps, there is new research potential. Proposals that explore the feasibility of combining administrative data for the major food assistance programs to describe characteristics of participants, participation dynamics, or timing of receipt and use of benefits are of special interest. Analytic studies of existing data sources are also welcome. For example, analyses of the impact of food assistance programs on food insecurity and food expenditures have generally focused on the Food Stamp Program (FSP). Such a focus often ignores the fact that the National School Lunch Program

(NSLP) and the School Breakfast Program (SBP) can make a substantial contribution to household food resources by providing children with up to 10 meals each week. Other USDA food assistance programs (e.g. WIC, the Child and Adult Care Feeding Program (CACFP), Summer Food Service Program, and food distribution programs) expand household resources as well. Studies are needed that evaluate multiple program impacts and/or participation decisions.

Grants/Cooperative Agreements

Understanding Causes and Consequences of Food Insecurity

Since 1995, USDA has sponsored annual survey supplements to the Current Population Survey (CPS) to assess the prevalence and severity of food insecurity in the United States. Substantial investments have also been made to incorporate food security measures into other national surveys (e.g. NHANES, CSFII, ECLS, SPD, PSID). Research is needed on such topics as the complex interactions between food insecurity and food assistance programs, the uneven temporal incidence of food insecurity, and the relationship of food insecurity to food expenditures and/or labor force activities. Studies examining linkages between community characteristics and food insecurity are also of interest. (Further information on food insecurity data and research can be found at http://www.ers.usda.gov/briefing/foodsecurity.)

Grants/Cooperative Agreements

Coping with Limited Resources

When facing limited resources, households make choices and undertake strategies to minimize and ameliorate the impacts of those constraints. These strategies include adjustments to diet quality and quantity, trading off food expenditures for other (nonfood) necessities such as housing and medical care, and drawing on support from friends and family. Another set of strategies involves participating in government programs for food and nutrition assistance, cash welfare, Medicaid, and/or housing assistance, as well as drawing on community emergency food resources. In addition to quantitative analyses of existing data, there is need for qualitative studies that document and explain in greater detail the coping process. Studies that broaden our understanding of general well-being by developing and associating alternative measures of well-being with food insecurity are also of interest.

Grants/Cooperative Agreements

A Study of the U.S. Emergency Food Assistance System: Provider and Recipient Characteristics

Many emergency food assistance providers are reporting increased demand for their services which some observers attribute to changes in the nation's welfare and food assistance safety net under welfare reform and decreasing ability to meet the additional demand. In fiscal 1998 a base contract was awarded to study providers' capacity to manage current and future changes in emergency food assistance. Project funding in fiscal 2000 will exercise a contract option to study the characteristics of households that receive emergency food assistance, including household

composition, income, and employment, current and past participation in Federal nutrition assistance programs, reasons for seeking emergency food assistance, and food security status.

Contract Option

Child Nutrition

WIC Cost-Containment Practices (*Legislatively mandated*)

A number of WIC programs have attempted to contain program costs by limiting branded products in the WIC food package and promoting more stringent selection of vendors. This mandated study (P.L. 105-277) will assess the effects of such cost-containment practices by States on: (1) program participation; (2) access and availability of prescribed foods; (3) voucher redemption rates and actual food selections by participants; (4) participants on special diets or with specific food allergies; (5) participant use of and satisfaction with prescribed foods; (6) achievement of positive health outcomes; and (7) program costs. In fiscal 1999, a base contract was awarded to collect data necessary to evaluate WIC cost-containment practices. Funding will be used in fiscal 2000 to exercise a contract option to analyze data collected in the base contract.

Contract Option

Expert Review of WIC Estimates

The Secretary of Agriculture committed USDA to an independent, external review of the method it uses to estimate eligibility for and participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). This study will review and evaluate present methods of determining the number of potentially eligible WIC clients. One area of particular concern is the use of outdated census data. ERS and FNS have met with the National Research Council (NRC) of the National Academy of Sciences to discuss the scope of work and a framework for conducting the study. With its ability to draw upon expertise from many different disciplines, NRC is well-suited to conduct this effort. More timely and accurate estimates might be derived that reflect population shifts, birth rates, and local conditions, possibly using State live birth records.

Interagency Agreement

Direct Certification and National School Lunch Program Integrity

Recent data suggest that there may be a discrepancy between the number of children approved for free school meals and the number of children eligible. Such discrepancies raise critical questions about the effectiveness of current procedures for completion, submission, review, verification, and action on applications for free and reduced price meals. Increased use of direct certification has been proposed as one method to reduce errors. Research is needed to understand the prevalence and operational issues of direct certification and the opportunities that exist for reducing errors through increased use of this administrative procedure. Research is also

needed to develop, demonstrate and evaluate the effectiveness of alternatives to current application processing requirements. A set of controlled and rigorously evaluated pilot tests should examine the effects of modifying application forms, requiring income documentation, increasing verification requirements, contracting out certification, and enhancing use of direct certification.

Contract

Child and Adult Care Food Program (CACFP) Cost Reimbursement Study

Recent investigations by USDA's Office of the Inspector General (OIG) and the General Accounting Office have raised concerns about the effectiveness of program oversight at the Federal and State levels. In addition, OIG has recommended that FNS revise the formula currently used to distribute administrative funds. An administrative cost study is needed to evaluate existing administrative cost structures in family day care homes and to support the development of potential alternative models for administrative funding.

Contract

Impact of School Lunch Environment and Program Participation

Anecdotal evidence suggests that the school lunch environment may influence the decision of whether a child obtains a school lunch as well as how much of the food the child eats. Research is needed to evaluate the importance of school lunch environment factors such as the quality and choices of foods served, the time lunch is served, how much time children have to eat lunch, whether lunch is after recess, the ambiance of the cafeteria, the availability of competitive foods, and, for older children, whether an open-campus policy is adopted officially or de facto. Studies are encouraged to suggest creative alternatives to address the problems identified by the findings.

Grants/Cooperative Agreements

Reducing the Prevalence of Obesity among WIC Children

An increasing proportion of children who participate in the WIC program are overweight or obese, yet little is known regarding the factors that contribute to a child becoming overweight or obese during the preschool years. FANRP is particularly interested in better understanding the role of factors that might be amenable to change through WIC's nutrition education activities. For example, how does breastfeeding affect the likelihood of a child being obese at the age of 2-5 years? What other feeding practices influence the likelihood of a preschool child becoming obese? What are some of the parental attitudes and perceptions about appropriate feeding practices or what constitutes a "healthy" child, and what are some of the sources of knowledge that influence parents' perceptions and practices? What market research would be needed to develop an enhanced program of nutrition education activities aimed at reducing the prevalence of overweight and obesity among children who participate in WIC?

Grants/Cooperative Agreements

Mother's Work, Time Constraints, and Child Nutrition

As increasing numbers of mothers join the labor force, less time is available for food preparation and other activities. Some working mothers may transfer some of the food preparation responsibilities to other household members or to day-care providers and schools. In some cases, relatively young children may be responsible for shopping and preparing their own meals, which may affect the types of foods they eat, food costs, and the quality of their overall diet. Or working mothers may depend more heavily on foods that require less time to prepare, such as prepared foods (either from the grocery store or from food service establishments, such as fast-food restaurants and take-outs). Earlier FANRP research shows that away-from-home meals are typically higher in fat and saturated fat and lower in calcium, fiber, and iron than home meals, so increased consumption might adversely affect diet quality. It has been suggested that children of working mothers spend more time watching television, which may potentially affect the child's energy balance. Research is needed to understand how households with working mothers, particularly low-income mothers, cope with the increased time constraints associated with labor force participation, the role and nutritional contribution of foods provided by day-care providers and schools, and the impacts of such coping strategies on their children's dietary patterns, diet quality, and obesity.

Grants/Cooperative Agreements

Research Breastfed Infants' Growth

In fiscal 1998, FANRP provided funding for adding a U.S. site to an international study on optimal growth rates of breast-fed infants. WIC clinicians require appropriate infant growth charts to determine when, and if, breastfeeding should be supplemented with formula to support weight gain. Current infant growth charts are based predominately on formula-fed infants, and hence, may suggest faster weight gains than optimal, leading to unnecessary formula supplementation. Additional funding will add a cross-sectional data collection component to the U.S. site. The study will collect information on the attained size of children 18-71 months who were breastfed for at least 3 months and whose growth is not constrained by social or environmental factors. The cross-sectional study supplements the ongoing longitudinal study of children from birth to 24 months, and will be used to develop reference growth charts for breastfed children up to 5 years.

Grant Amendment

Behavioral Nutrition

Economics of Food Choices

Given the marked changes in dietary patterns of Americans during the last quarter century, research is needed to understand the roles played by various determinants, such as expansion of food assistance programs, changes in prices, incomes, and education; increased accessibility of

fast-food; age and/or cohort effects; increased labor force participation by women; regulatory actions by the government; expansions in nutrition knowledge; and changes in tastes. What have been the returns to food assistance programs and nutrition information programs? Have the effects of education or income on diet choices changed over time? How do these effects differ across sociodemographic groups? Can food assistance programs use economic incentives to promote healthier eating patterns? Another area of particular interest is the public and private costs and benefits of healthier diets for low-income households; special attention could be devoted to the types of opportunity costs that low-income households face, e.g., medical or housing needs that are competing for food in the household's budget. In addition, studies are needed on the roles played by cultural, social, and psychological factors that may be more profound for food choices than for other consumption behaviors. Research is needed as well on the intertemporal costs and benefits of food choices. Do consumers recognize that food intakes in the current period have long-term health consequences, and do their current food choices reflect intertemporal tradeoffs? Do sociodemographic groups differ in the extent to which their food choices incorporate intertemporal tradeoffs?

Grants/Cooperative Agreements

Social Marketing and Market Segmentation Research

Research is needed to improve our understanding of the needs, wants, perceptions, knowledge, attitudes, emotions, concerns, and motivations of food assistance clientele relating to overcoming barriers to healthy eating. One needed step is the development of sociodemographic/lifestyle stratifications and/or market segments for use in social marketing of nutrition education and program outreach, with the objective of improving eating patterns and diet quality.

Grants/Cooperative Agreements

Eating Patterns, Dietary Quality, and Obesity

Research is needed to identify eating patterns that show a strong association with diet quality and/or obesity. For example, research suggests that younger children have better diet quality (as measured by the USDA Healthy Eating Index, or HEI) than teenagers, that individuals who eat breakfast tend to have better diet quality, and that variety in vegetable intake (excluding potatoes) is negatively associated with the body mass index (BMI). Concerns have been raised that high intake of added sugars may have a negative impact on diet quality, and that consumption of soft drinks is displacing milk consumption, although little is known about how intake and sources of added sugars (or sugar substitutes) influence diet quality and/or obesity, or whether individuals who stop consuming soft drinks would replace it with milk. The ability to identify "typologies" of eating patterns that are associated with diet quality and/or obesity may be helpful in categorizing individuals for better targeting of nutrition information, for program design, and for service delivery.

Grants/Cooperative Agreements

Development of Obesity, Food Insecurity, and Food Assistance

The growing prevalence of obesity, and its occurrence at earlier ages, is of concern to public health officials. Analysis of cross-sectional data, such as the CSFII or NHANES, is useful in identifying some of the behavioral choices that are associated with the presence of obesity, but are not useful for explaining what behavioral choices are associated with the development of obesity. For example, cross-sectional data do not allow the researcher to determine whether certain dietary patterns (such as high intake of calories from fat) or activity levels influence the development of obesity, or if instead the dietary patterns or activity levels are consequences of being overweight or obese (for example, obese individuals may seek comfort in high-fat foods). Such behaviors may involve food insecurity as well. Some have hypothesized that people who are frequently food insecure may have irregular diets with feast/famine cycles that may ultimately result in obesity. To better understand the temporal issues, a longitudinal perspective is needed. FANRP is interested in funding research to analyze data from longitudinal studies--such as the Framingham Study, MR. FIT, or the Nurses' Health Study--that might provide insights on the factors associated with the development of obesity. Of particular interest is understanding the roles that food insecurity and food assistance programs may play in the development or prevention of obesity.

Grants/Cooperative Agreements

Enhanced Food Assistance Research Data

Food Security: Current Population Survey Supplement, September 2000

With the enactment of welfare reform, the Food Stamp Program, along with other food assistance programs, has become the core Federal safety net for assuring the food security and basic well-being of low-income Americans. National measures of household food security prevalence and severity are an integral component of the Department's monitoring and program assessment activities. This project provides funds to collect data in the September 2000 Supplement to the Current Population Survey (CPS) conducted by the Census Bureau.

Interagency agreement (Census)

Early Childhood Longitudinal Surveys

This project provides supplemental funds for the incorporation of additional variables in the Early Childhood Longitudinal Survey's Birth Cohort (ECLS-B) and Kindergarten Cohort (ECLS-K) sponsored by the National Center for Educational Statistics, U.S. Department of Education. The surveys are nationally representative samples of about 12,000 newborns and 23,000 kindergartners who will be assessed through, respectively, the first grade or the fifth grade, for factors affecting readiness for school or school performance. Information will be collected each year from birth records, children, parents, and teachers. The items proposed by USDA to be included in the surveys relate to participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), school meals programs, and other USDA food-assistance programs; infant feeding practices; household food security; children's physical activity; and

children's height and weight. ECLS-B will provide a wealth of information not previously collected about infants and young children in WIC, and should allow for examination of the links between WIC participation and cognitive development as well as the relationship of infant feeding practices to health outcomes (such as obesity) in early childhood. ECLS-K will allow examination of such topics as the relationship between household food shortages and children's physical and cognitive development, and the link between participation in school nutrition programs and learning in the early school years.

Interagency agreement (DOE)

National Health and Nutrition Examination Survey (NHANES-IV)

This project provides supplemental funds to support enhancements to the food assistance and nutrition components of the Department of Health and Human Services' National Health and Nutrition Examination Survey IV (1999-2005). This is the premier national survey for linking diets with health outcomes and for assessing nutritional risks. The key variables of interest to FANRP include dietary intake and nutritional status, anthropometric measurements, use of vitamin and mineral supplements and medications, tobacco and alcohol use, physical activity, and sociodemographic characteristics.

Interagency agreement (DHHS)

Enhancing Food Assistance Program Data: Assessment, Feasibility, and Recommendations for Linking Administrative and Survey Data for Program and Policy Research

The recent identification of outcome-based goals and objectives for USDA's food and nutrition assistance programs highlights the continuing need for a solid informational capacity for tracking program performance. This study will examine the feasibility of several alternatives for improving the usefulness of available data on nutritional intake, hunger and food insecurity, food assistance program participation, and general client well-being. Questions for consideration include: What opportunities are there for linking administrative data to ongoing national surveys? How can information from the National Nutrition Monitoring System on dietary intake, diet knowledge, and attitudes be linked more closely with information on food assistance and nutrition education program access, eligibility, and usage patterns? What obstacles need to be overcome? Are there other opportunities for using administrative data or supplementing administrative data with specialized surveys?

Contract

Research Innovation, Infrastructure, and Outreach

Small Grants Program for Innovative Research and Outreach

In fiscal 1998, the FANRP Small Grants Program was created to stimulate new and innovative research and to broaden the participation of social scientists in food assistance research. Five administering institutions were selected, with each focusing on a particular facet of food

assistance. This project provides continued funding for this program. The five institutions and areas of focus are:

- The Joint Center for Poverty Research, University of Chicago and Northwestern University: targets research on the interactions between food assistance and other welfare programs such as TANF and housing assistance, and linkages between the macroeconomy and food assistance.
- The Southern Rural Development Center at Mississippi State University: examines food assistance impacts on rural people, families, and communities in the South. The Center also initiated a dialogue among scholars through the establishment of a Rural South Food Assistance Research Task Force, with the purpose of further articulating research priorities on food assistance-related issues among 1890's Institutions. The Task Force will be looking, for example, at issues related to community food security.
- The University of Arizona, American Indian Studies Program: partners with scholars at tribal colleges and elsewhere to support research addressing the unique issues and problems of Native Americans, a largely underserved population with respect to food assistance.
- The University of California at Davis, Department of Nutrition: targets research on developing a broad cadre of diet and nutrition indicators for use in assessing the impact of food assistance programs. The demand for this research was identified at the 1998 stakeholders' meeting at the National Academy of Sciences.
- The Institute for Research on Poverty at the University of Wisconsin: focuses research that addresses the effects of food assistance on individual and family well-being and food security.

Grants

Food and Nutrition Information Center, National Agricultural Library

This project provides support to the National Agricultural Library for systematically storing and disseminating information on USDA's food assistance programs, nutrition education, and related nutrition issues, including a premier website on food assistance and nutrition research.

Interagency agreement (NAL)

Food and Nutrition Summer Institute

This project helps sponsor the Food and Nutrition Summer Institute, which has the objective of positioning the nutrition programs of historically black colleges and universities to meet research and education challenges, and of creating a stronger voice and action for nutrition education, research, and policy within the African American Community.

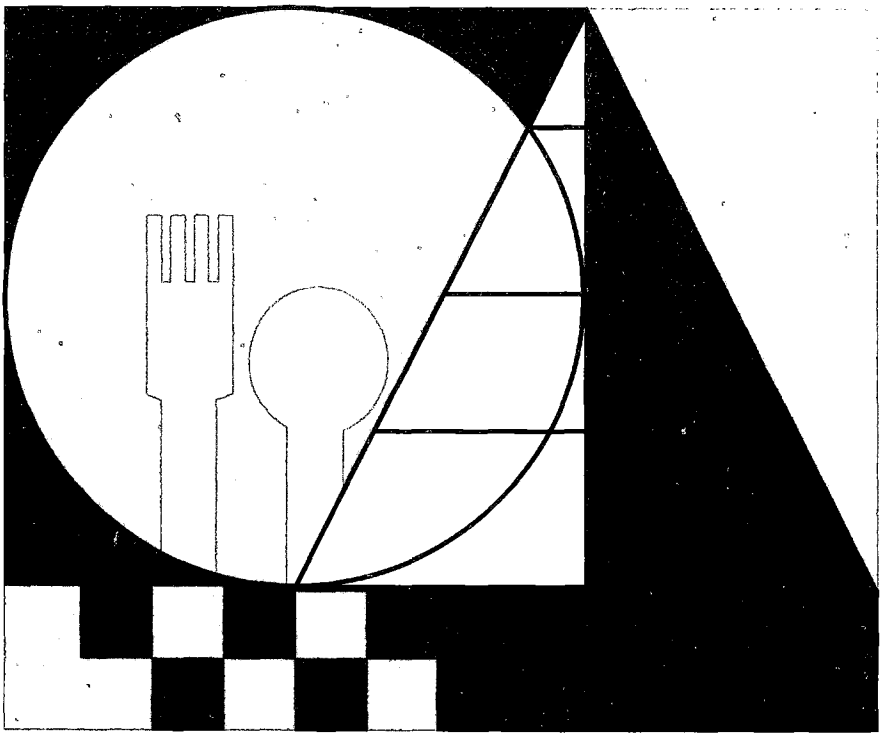
Interagency agreement (ARS)

The Economic Research Service

Food Assistance and Nutrition Research Program

Final report: Fiscal 1999 Activities

Mission: Research for a Healthy, Well-Nourished America



Food Assistance & Nutrition Research



Food Assistance and Nutrition Research Program

Mission: Research for a Healthy, Well-Nourished America

Program at a Glance

USDA's Economic Research Service (ERS) has responsibility for conducting studies and evaluations of the Nation's domestic food and nutrition assistance programs, including the Food Stamp Program (FSP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the Child Nutrition Programs. ERS established the Food Assistance and Nutrition Research Program (FANRP) to carry out this responsibility. FANRP's goal is to conduct research to meet the critical information needs of the program managers, policy officials, the research community, and the public at large. In fiscal 1999, Congress provided $10.195 million for these activities.

In developing research priorities, FANRP works closely with USDA's Food and Nutrition Service (FNS), the agency responsible for administering the Department's food assistance and nutrition programs. FANRP also seeks input from a broad constituency of policy officials, researchers, practitioners, advocates, industry groups, and service providers. In conjunction with these activities, FANRP sponsors an annual round-table discussion to identify crucial research and information needs that would support food assistance and nutrition programs and to ensure the policy- and program-relevance of the annual research agenda. The program's perennial themes are diet and nutritional outcomes, food-program targeting and delivery, and program dynamics and administration.

FANRP projects utilize the capabilities of both external researchers and ERS staff. FANRP funds a portfolio of extramural projects through competitive contracts and through a tightly-run peer review process for awarding competitive grants and cooperative agreements. Peer reviewers include experts from academia, government, and the private sector. FANRP projects benefit from the involvement of ERS researchers and ERS's long and distinguished history of conducting rigorous, comprehensive, and policy-relevant research. FANRP also sponsors a Small Grants Program to stimulate new research and to broaden the participation of social science scholars in food assistance and nutrition issues. Research results are widely disseminated in accordance with FANRP principles. This report provides a brief summary and overview of FANRP.

Program Contacts

Betsey Kuhn, Director, ERS Food & Rural Economics Division **David Smallwood**, Program Director, FANRP **Mark Prell**, Research and Information, FANRP **Margaret Andrews**, Food Stamp Program Research, FANRP **Elizabeth Frazão**, Child Nutrition & WIC Research, FANRP **Leslee Lowstuter**, Business Manager, FANRP	**Phone:** (202) 694-5270 **FAX:** (202) 694-5677 **e-mail:** FANRP@econ.ag.gov **website:** www.econ.ag.gov/briefing/foodasst

Program Principles

The program principles behind FANRP ensure the reliability and usefulness of the research.

- Research that meets the needs of all stakeholders--program participants, USDA, Congress, and the public
- Integrated, comprehensive program that conducts research in the broader context of the current and future economic and social environments
- Broad array of public and private entities directly involved in the research, evaluation, and review efforts
- Integration of ERS staff expertise in the development, implementation, and accomplishment of research projects
- Scientifically rigorous studies and evaluations with verifiable and unbiased results
- Rigorous internal and external review of research results
- Public availability of data
- Wide distribution of research findings
- Development and maintenance of continuous data sets

Program Highlights, Fiscal 1998-99

FANRP responds to immediate and long-term research needs. FANRP adopted the *Food Stamp Caseload Decline* as one of its highest 1999 research priorities, responding to the interest that policymakers and the public expressed about the recent unexpectedly large drop in food stamp participation. Another major new topic is *Better Serving the Working Poor*, recognizing that with an increased policy emphasis on work and personal responsibility, assistance programs of all types are evolving to provide improved support for the working poor. A *Nutrition and Health Outcomes and Dietary Behavior* theme is included in the 1999 agenda to reflect the emerging research priority of the role of behavioral influences on nutrition and health outcomes. Another component of the 1999 research agenda is *Food Security*. While food security at the household level is an ongoing aspect of the theme, FANRP expanded the theme in fiscal 1999 with new projects on food security at the individual level and at the community level, building on the Department's recent Community Food Security Initiative. *Program Integrity and Effectiveness* and *Enhanced Food Assistance Research Data* continue as major themes for the program.

Highlights of FANRP include responsibility for three Congressionally-mandated studies:

- WIC Cost-Containment Practices
- State Use of Funds To Increase Work Slots for Food Stamp Recipients
- Study of Meal Reimbursement Changes for Family Daycare Homes

FANRP has constructed a multifaceted research plan to increase understanding of the Food Stamp Program (FSP). In this era of welfare reform, FANRP research examines interactions between the FSP and other welfare programs, as well as the roles of the macroeconomy and welfare reform in the FSP caseload decline. Other studies examine the effects on FSP clients of administrative changes in welfare offices, the well-being of households who leave the FSP, and the contrast between FSP participants and eligible nonparticipants. FANRP research addresses the two food stamp target groups most adversely affected by welfare reform: able-bodied adults without dependents (ABAWDs) and legal immigrants. To explore how the FSP might better serve the working poor, FANRP examines conditions of low-income working families and their program participation rates, and connections between the program's rules and administration and the circumstances of the working poor.

FANRP is also responsible for conducting studies on other USDA food assistance and nutrition programs. FANRP funded a research design study to evaluate the impact of the School Breakfast Program on learning and cognitive development. Another new research design study pertains to the Summer Food Service Program's sponsor and site characteristics, and the comparative characteristics of participants and eligible nonparticipants. FANRP research investigates the long-term effects of assistance programs by funding a comprehensive assessment of what is known about the dietary and health outcomes of program participation.

FANRP collaborates with FNS to shed light on the policy-relevant issues of waste, fraud, and abuse in food assistance and nutrition programs. One study funded by FANRP updates the food stamp trafficking study conducted several years ago by FNS, while another focuses on computer matching to detect fraud in the FSP. Additional work examines the effects on the working poor, error rates, and administrative cost-savings in the FSP of replacing retrospective monthly earnings reporting with prospective quarterly reporting. Another study evaluates available tools for States to prevent fraud and abuse by WIC clients and staff.

Behavioral choices, socioeconomic conditions, and governmental programs each influence nutrition and health. FANRP research examines the effects of breastfeeding consultations and education on breastfeeding choices and duration, infant health, and infant medical costs. The impact of breastfeeding on optimal growth rates is also being examined. Another study examines the effects of eating patterns, away-from-home eating, and food assistance and nutrition programs on the diets of low-income children and teens. FANRP research considers the roles of demographics, incomes, food prices, nutrition knowledge, and consumer information in influencing diet quality. FANRP work on dietary behavior also includes the high costs of poor eating patterns, the contrast between food consumption and dietary recommendations, the impact on diet of food assistance programs, and the nutrient content of away-from-home foods. FANRP initiated a set of studies on childhood obesity--a national problem that has increased substantially--to examine the determinants of overweight and obesity among low-income children. Other studies examine factors affecting the nutrient intake of the elderly, and construct food cost indexes for low-income households and the general population.

In the early 1990's, researchers in government and academia collaborated in the development of measures of the prevalence and severity of household food insecurity. FANRP continues to fund annual monitoring of food insecurity at the state level, and has initiated new research projects in the area of food insecurity and hunger including examination of factors that influence food insecurity among female-headed households, and how food insecurity impacts the physical and emotional

well-being of their children. FANRP also sponsored a conference to identify instruments that can facilitate community food security analysis at the local level. One study uses nutrient intake data to ascertain the external validity of a measure of food insufficiency. Another project will identify the service areas, characteristics, and operations of food banks, food pantries, and emergency kitchens and will obtain national estimates of the total number of recipients served and the quantities and types of foods.

FANRP funding enhances food assistance data collection in several nationwide surveys, including the Continuing Survey of Food Intakes by Individuals, the National Health and Nutrition Examination Survey, the Panel Study of Income Dynamics, the Current Population Survey, and the Early Childhood Longitudinal Studies.

FANRP also initiated a Small Grants Program in fiscal 1998. Five themes are pursued through programs established at the following academic institutions and affiliated research institutes:

- Interactions between food assistance and other welfare programs, and linkages between the macroeconomy and food assistance. *The Joint Center for Poverty Research at the University of Chicago and Northwestern University*
- Effects of food assistance on well-being and food security. *The Institute for Research on Poverty at the University of Wisconsin.*
- The relationship between family poverty and food assistance programs among Native Americans. *The American Indian Studies Program at the University of Arizona.*
- The relationship between food assistance and rural people, families, and communities in the South. *The Southern Rural Development Center at Mississippi State and Alcorn State Universities.*
- The impact of food assistance programs on nutritional risk indicators (clinical, anthropometric, biochemical, and dietary), food purchasing practices, and food insecurity. *The Department of Nutrition at the University of California at Davis.*

Fiscal 1999 Program Themes and Funded Projects

The following is an abbreviated list of projects funded under FANRP in fiscal 1999 (see Table 1 for more detailed information):

Food Stamp Program Caseload Decline

- Program Access and Declining Food Stamp Program Participation
- What Explains Changes in Food Stamp Program Caseloads?
- The Effects of Welfare Implementation on Food Stamp Caseloads
- Causes and Consequences of Food Insufficiency After Welfare Reform
- Devolution and Urban Change

Better Serving the Working Poor

- Improving Access to Food Stamps for Low-Income Working Households
- Restructuring Food Stamps to Help Working Families
- Program Integrity and Improved Service to the Working Poor Under Alternative Reporting Plans

Nutrition and Health Outcomes and Dietary Behavior

- Understanding Child Nutrition in the Year 2000: Dynamic Shifts and Their Determinants
- Obesity in Low-Income Mothers and Children
- Factors Affecting Childhood Obesity Among Low-Income Households
- Determinants of Overweight and Obesity Among Low-Income Children
- Economic Benefits of Breastfeeding Promotion: A Controlled Clinical Trial
- Food Security and Health Outcomes in the California Health Interview Survey
- Evaluating the Impact of School Breakfast on Learning: Design and Feasibility

Food Security Measurement and Research

- Hunger: Its Risk and Impact in Poor, Female-Headed Households With Children
- Food Security Measurement Research
- Community Food Security Assessment Conference
- Community Food Security Assessment Toolkit

Program Integrity and Effectiveness

- WIC Cost-Containment Study
- WIC Program Integrity Research
- Summer Food Service Evaluation: Design, Cost, and Evaluation

Research Outreach

- Food Assistance and Nutrition Research Small Grants Programs:

  ✓ Southern Rural Development Center, Mississippi and Alcorn State Universities
  Linked TANF and Food Stamp Program Participation Decisions: Understanding the Direct and Indirect Impacts of Welfare Reform
  A Comparison of Food and Nutrient Intakes, Food Purchase Patterns, Level of Food Security, and Selected Demographic Variables Among Food Stamp Program Recipients and Nonrecipients in South Carolina and Tennessee
  Can Religious Congregations Satisfy Those Who Hunger and Thirst for Justice? An Assessment of Faith-Based Food Assistance Programs in Rural Mississippi
  Food Stamp Utilization Patterns in Rural Counties in Texas: A Multilevel Analysis of the Micro- and Macro-Level Determinants of Caseload Dynamics
  Nutrient Intakes of Food-Insufficient and Food-Sufficient Adults in the Southern Region of the United States and the Impact of Federal Food Assistance Programs

  ✓ The American Indian Studies Program (AISP), University of Arizona
  The deadline for proposals to AISP was September 17, 1999. AISP will make final decisions on grant awards in October 1999.

- ✓ Institute for Research on Poverty, University of Wisconsin
  Development of a Face-Valid Food Security Monitoring Tool
  Food Insecurity and Welfare Reform

- ✓ Joint Center for Poverty Research, University of Chicago and Northwestern University
  Does Participation in Multiple Welfare Programs Improve Birth Outcomes?
  How Has Welfare Reform Affected Take-Up of Food Stamps and Medicaid?
  Monitoring Changes in Food Security Among Single Mothers

- ✓ Department of Nutrition, University of California at Davis
  Food Stamps, Ethnicity, and Nutrient Supplements: Association with Food Intake and Knowledge, Attitudes, and Beliefs About Nutrient Supplement Use
  Etiology of Iron Deficiency and Iron Deficiency Anemia Among Children Aged 12-36 Months
  Unsafe Food Acquisition Practices Used by Limited Resource Individuals
  Factors Mediating the Use of Food Assistance Programs and Coping Strategies To Improve Food Security and Nutritional Well-Being Among a Low Income Hispanic Population

- Food and Nutrition Information Center: Research Information Dissemination
- Improving Measurement of Health and Nutrition Outcomes
- Rural Dimensions of Welfare Reform Conference
- Committee on National Statistics
- Food and Nutrition Summer Institute

Enhanced Food Assistance Research Data

- National Food Price Data System Enhancement
- Panel Study of Income Dynamics
- Early Childhood Longitudinal Study (Birth Cohort)
- Measuring Food Security: April 1999 Current Population Survey Food Security Supplement
- National Health and Nutrition Examination Survey

Fiscal 1998 Program Themes and Funded Projects

The following is an abbreviated list of projects funded under FANRP in fiscal 1998 (see Table 2 for more detailed information).

Welfare Reform

- Family Child Care Homes Legislative Changes Study
- Report to Congress on Use of Food Stamps To Purchase Dietary Supplements
- Report to Congress on State Use of Funds To Increase Work Slots for Food Stamp Recipients
- Expanded Study of Welfare Reform on Immigrants
- Temporary Assistance to Needy Families (TANF)-Leavers' Use of Food Stamps
- Studies of Households Who Leave the Food Stamp Program
- A Study of U.S. Emergency Food Assistance System: Provider and Recipient Characteristics

- Food Program Targeting and Delivery
- Program Forecasting and Budget Analysis
- A Study of Changes in Food Stamp Program Administration Processes Related to Welfare Reform
- Simplified Food Stamp Program Technical Assistance
- The Extent of Trafficking in the Food Stamp Program After Welfare Reform

Food Security

- Measuring Food Security: August 1998 Current Population Survey Supplement
- Research To Strengthen and Improve Measures of Food Security
- Economic Research Service's Second National Food Security Research and Measurement Conference

Nutrition and Health

- WIC and Childhood Development: Early Childhood Longitudinal Study-Birth Cohort 2000
- Early Childhood Longitudinal Survey-Kindergarten Cohort
- Dietary and Nutrition Outcomes (Nutrition Risk Followup)
- Evaluating Food Stamp Nutrition Education
- Research To Assess Links Between Diet Quality and Health
- Development and Evaluation of the Nutritional Anthropometric Assessment Software in WIC Clinics (Epi Info 2000/Nustat Module)
- Research on Breastfed Infants' Growth
- Nutritional Advantages of Including More Beef, Lamb, and Chevon Meats in the National School Lunch Program

Program Integrity and Effectiveness

- Assessment of Computer Matching in the Food Stamp Program
- Evaluation of EBT Customer Service Waivers on Recipients
- Nutrition and Health Outcomes of USDA Food and Nutrition Assistance Programs

Research Outreach

- Food Assistance and Nutrition Research Small Grants Programs:

✓ Southern Rural Development Center, Mississippi State University
Economic Downturns and Welfare Reform: An Exploratory County-Level Analysis
The Impact of Food Stamp Reforms on the Elderly in Mississippi
Assessing the Benefits and Problems Associated With the Use of Electronic Benefits Transfer for Food Stamps in Macon County, Alabama
Private Food Assistance in East Alabama
Understanding Hunger and Food Insecurity in Kentucky
From Welfare to Wage Work

✓ The American Indian Studies Program (AISP), University of Arizona
Assessment of Food Concerns, Nutrition Knowledge, and Food Security of Oglala Lakota College Students on the Pine Ridge Reservation
A Dietary History and Behavior Study on the Cheyenne River Reservation

The Impact of Food Assistance Programs on American Indian Reservations: The Northern Cheyenne Case Study
Federal Food Programs, Traditional Foods, and the Gros Ventre and Assiniboine Nations of the Fort Belknap Indian Reservation
Monitoring Health and Nutrition on the Navajo Nation

✓ Institute for Research on Poverty, University of Wisconsin
Independent Validation of the Core Food Security Measure With Asian and Pacific Islanders
A Macro-Level Analysis of the Private Food Assistance Network
Food Insecurity and Immigrant Well-Being: Mexican Immigrants to the United States
Effects of Participation in Food Assistance Programs: Evidence from NLSY Children

✓ The Joint Center for Poverty Research, University of Chicago and Northwestern University
Immigration and the Food Assistance Program
State Budgetary Behavior and the Fiscal Interactions Between Food Stamps, AFDC, Medicaid, and SSI
Does the Minimum Wage Affect AFDC and Food Stamp Participation?
The Effects of Food Stamp and WIC Participation on Low-Income Families with Young Children
The Consequences of Food Insecurity for Child Well-Being: An Analysis of Children's Health and School Behavior Outcomes

✓ Department of Nutrition, University of California at Davis
Impact of Food Insecurity and Food Assistance Program Participation on Nutritional Risk and Functional Impairment in the Elderly
Relationships Between Participation in Food Assistance Programs and Skeletal Health
Influence of Food Stamps on the Nutritional Status of Inner-City Preschoolers From Hartford, CT, Who Receive WIC Benefits

- Food and Nutrition Information Center: Research Information Dissemination

Policy Research
- Food Stamp Program Microsimulation and Related Analysis
- WIC General Analysis Project
- Child Nutrition Analysis Projects

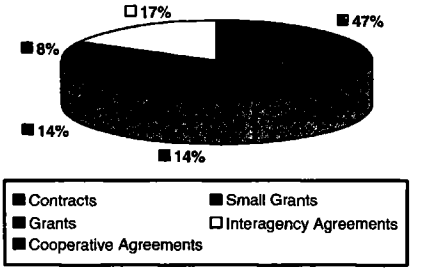
Enhanced Data Development
- Continuing Survey of Food Intakes by Individuals
- Panel Study of Income Dynamics
- National Health and Nutrition Examination Survey

Competitively Funded Extramural Research Program, Fiscal 1999

To meet the programmatic needs of the Department and to promote research from a broad arena, FANRP uses a variety of funding mechanisms. Contracts are used when a very specific product is required, such as compliance with a Congressional mandate. When the intent is to stimulate new and innovative research or to undertake projects conducted jointly with ERS researchers, cooperative agreements and grants are used. The extramural research program is publicly announced and competitively awarded through the use of peer review panels.

Seven contracts were awarded in fiscal 1999 in the areas of program integrity and effectiveness, analysis of food stamp program access, food security, and two research designs for the School Breakfast Program and the Summer Food Service Program. Funding for contracts totaled $4.30 million.

Share of Extramural Awards by Type, FY 1999



The Competitive Grants and Cooperative Agreements Program is announced broadly, with program announcements mailed out to universities, nonprofit and for-profit organizations, and State and local governments. The announcement was posted on the Internet through the ERS website. Funding for seven cooperative agreements totaled $1.32 million in fiscal 1999. In addition, a total of $1.35 million funded six grants. The acceptance rate for proposals of cooperative agreements and grants was roughly one in three, or in dollars terms roughly $1 in $5. Cooperative agreements and grants were awarded to conduct research on such topics as food stamp caseload changes, food stamps and the working poor, the determinants of obesity in low-income children, the economic benefits of breastfeeding counseling, and program integrity under alternative reporting plans.

The Small Grants Program funds grant competitions at five diverse institutions with each focusing on a particular facet of food assistance, such as diet and health outcomes, relationships to poverty and well-being, rural issues, and special at-risk population groups. Funding for small grants totaled $750,000 in fiscal 1999.

Interagency agreements are used to enhance food assistance data development through cost-sharing partnerships and to fund cooperative interagency research on program interactions and policy issues. These interagency projects include funding for additional data collection in the National Health and Nutrition Examination Survey (NHANES), the Panel Study of Income Dynamics (PSID), and the Early Childhood Longitudinal Study—Birth Cohort, as well as the food security module of the Current Population Survey (CPS), and the Devolution and Urban Change Project. Funding for interagency agreements totaled $1.60 million in fiscal 1999.

Research Mission and Future Direction

FANRP addresses the research needs of the Nation's food assistance and nutrition programs. Its research analyzes the benefits of improved diets and food choices, the factors that influence diet and nutrition, and the outcomes of policies and programs aimed at improving the nutrition, well-being, and food security of Americans. These programs include the Food Stamp Program, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and Child Nutrition Programs.

In fiscal 1998, monthly participation in the Food Stamp Program averaged 19.8 million Americans, at an annual cost of approximately $18.9 billion. On average, WIC served 7.4 million women, infants, and children each month, at an annual cost of $3.9 billion. On a typical school day, some 7.3 million children participated in the School Breakfast Program and 27.2 million children participated in the National School Lunch Program. These two programs altogether cost $7.1 billion in fiscal 1998. With food assistance and nutrition programs receiving substantial funds and affecting the daily lives of millions of Americans, FANRP research must be of the highest integrity. Accordingly, one of FANRP's founding principles is to provide scientifically rigorous studies and evaluations with verifiable and unbiased results.

FANRP is building on ERS's strong foundation of solid, objective, and timely research. ERS has a long rich history of analyzing food assistance and nutrition programs and the economics of food choice, nutrition intake, and diet quality. An annotated bibliography, ***Two Decades of Excellence***, compiles 20 years of ERS research accomplishments in the areas of food assistance, poverty and well-being, food choices, and nutrition. FANRP research benefits from that tradition, and from the expertise and contributions of ERS staff to current FANRP projects.

FANRP will continue to conduct and disseminate policy-relevant and programmatic research that informs decisionmakers and the public. FANRP will continue to integrate intramural research with the extramural program, enhancing its capacity to address policy and research needs of USDA's food assistance and nutrition programs in a timely, objective, and cost-effective manner. To identify and prioritize research needs and policy issues, FANRP will continue to seek input from key constituencies such as policy officials, program and research leaders, and the Food and Nutrition Service.

"A Healthier, Well-Nourished America" is our research mission. Our goal is a high-quality, multidisciplinary program that focuses on today's problems and while addressing tomorrow's issues.

Food Assistance and Nutrition Research Program Publications

The following is a list of publications completed by the Food Assistance and Nutrition Research Program since fiscal 1998, its first year of mandated responsibility. Please visit ***www.econ.ag.gov*** to identify earlier ERS publications on the economics of food choices, nutrient intake, and diet quality.

Aldrich, L. Consumer Use of Information: Implications for Food Policy, AHR-715. USDA, ERS. June 1999.

Weimer, J.P. "Breastfeeding: Health and Economic Issues," FoodReview, Vol. 22, Issue 2, USDA, ERS, May-August 1999.

Frazão, E., ed. America's Eating Habits: Changes and Consequences, AIB-750. USDA, ERS. May 1999.

Contents:

Kennedy, E., Blaylock, J., and Kuhn, B. "On the Road to Better Nutrition."
Frazão, E. "High Costs of Poor Eating Patterns in the United States."
Davis, C., and Saltos, E. "Dietary Recommendations and How They Have Changed Over Time."
Tippett, K.S., and Cleveland, L.E. "How Current Diets Stack Up: Comparison With Dietary Guidelines.
Kantor, L.S. "A Comparison of the U.S. Food Supply With the Food Guide Pyramid Recommendations."
Kennedy, E., Bowman, S.A., Lino, M., Gerrior, S., and Basiotis, P.P. "Diet Quality of Americans: Healthy Eating Index."
Crane, N.T., Hubbard, V.S., and Lewis, C.J. "American Diets and Year 2000 Goals."
Putnam, J., and Gerrior, S. "Trends in the U.S. Food Supply, 1970-97."
Huang, K. "Role of National Income and Prices."
Gallo, A.E. "Food Advertising in the United States."
Blisard, N. "Advertising and What We Eat: The Case of Dairy Products."
Mathios, A.D., and Ippolito, P. "Health Claims in Food Advertising and Labeling: Disseminating Nutrition Information to Consumers."
Lin, B.H., Guthrie, J., and Frazão, E. "Nutrient Contribution of Food Away From Home."
Guthrie, J.F., Derby, B.M., and Levy, A. "What People Know and Do Not Know About Nutrition."
Variyam, J.N. "Role of Demographics, Knowledge, and Attitudes: Fats and Cholesterol."
Bishow, J., Variyam, J.N., and Blaylock, J. "Who Knew? Perception and Reality of Cholesterol in Our Diets."
Levedahl, J.W., and Oliveira, V. "Dietary Impacts of Food Assistance Programs."
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Lutz, S., Hirschman, J., and Smallwood, D.M. "National School Lunch and School Breakfast Program Reforms: Policy Development and Economic Impacts."
Weimer, J. "Accelerating the Trend Toward Healthy Eating: Public and Private Efforts."
Young, C.E., and Kantor, L.S. "Moving Toward the Food Guide Pyramid: Implications for U.S. Agriculture."

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"Food Assistance and Nutrition Research Program, Research Priorities: Fiscal Year 1999," USDA, ERS, February 1999.

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Peer Reviewers, Competitive Grant and Cooperative Research Program, FY99

Randy Albelda	University of Massachusetts—Boston
Dawn Aldridge	USDA/Food and Nutrition Service
Janet Allen	WIC Florida
P. Peter Basiotis	USDA/Center for Nutrition Policy and Promotion
Gary Bickel	USDA/Food and Nutrition Service
Robert Breunig	Australian National University
Graham Colditz	Harvard University
Gilbert L. Crouse, Sr.	DHHS/Office of Assistant Secretary for Planning and Evaluation
Janet Currie	University of California—Los Angeles
Stacy Dean	Center on Budget and Policy Priorities
Michael DePiro	USDA/FNS
Stacy Dickert-Conlin	Syracuse University
Bill Dietz	DHHS/Centers for Disease Control and Prevention
Rosemarie Downer	USDA/FNS
Peter Eisinger	Wayne State University
David Figlio	University of Florida
Gail Gates	Oklahoma State University
Jonah Gelbach	University of Maryland
Jenny Genser	USDA/Food and Nutrition Service
Lisa Greenwood	USDA/Food and Nutrition Service
Joanne Guthrie	DHHS/Food and Drug Administration
Lisa Harnack	University of Minnesota
Ed Herzog	USDA/FNS
Thomas Hirschl	Cornell University
Leif Jensen	Pennsylvania State University
Rachel Johnson	University of Vermont
Laura Kettle-Khan	DHHS/Centers for Disease Control and Prevention
Maureen Kilkenny	Iowa State University
Alana Landey	DHHS/Office of Assistant Secretary for Planning and Evaluation
Phillip Levine	Wellesley College
Anne Mardis	USDA/Center for Nutrition Policy and Promotion
Vicki McCracken	Washington State University
Patricia McKinney	USDA/Food and Nutrition Service
Suzanne Murphy	University of Hawaii
Aviva Must	Tufts University
Rudy Nayga	Texas A&M
Dianne Neumark-Sztainer	University of Minnesota

Teresa Nicklas	University of North Dakota
Mark Nord	USDA/Economic Research Service
Jennifer Olmstead	USDA/Economic Research Service
Victor Oliveira	USDA/Economic Research Service
Mary Frances Picciano	DHHS/National Institutes of Health
Shirley Porterfield	Washington University
Michael Puma	Urban Institute
Anu Rangarajan	Mathematica Policy Research
David Ribar	George Washington University
Peter Rossie	University of Massachusetts—Amherst
Seth Sanders	Stanford University
Nancy Sherwood	University of Minnesota
John Smith	Rhode Island Department of Health
Frank Stafford	University of Michigan
David Super	Center on Budget and Policy Priorities
Lowell Taylor	Carnegie-Mellon University
Laura Tiehen	UDSA/Economic Research Service
Peggy Trouba	WIC Nebraska
Cynthia Reeves Tuttle	University of Maryland
Beth Weatherbee	WIC Deleware
James Ziliak	University of Oregon

Table 1
FANRP Extramural Research Studies: Fiscal 1999

Research Projects/Award *Food Stamp Program Caseload Decline*	Objective	Estimated Cost
Program Access and Declining Food Stamp Program Participation **Abt Associates, Inc.**	To examine how the decisions by clients to participate in the Food Stamp Program have been affected by changes, such as customer service at local welfare office and increases in stigma associated with welfare reform. Population groups of special interest include legal immigrants, ABAWDs, child-only cases, and households exiting TANF.	**$1,889,035**
What Explains Changes in the Food Stamp Program Caseloads? **Abt Associates, Inc.**	To estimate the impacts on Food Stamp Program caseloads of economic trends, demographic changes and welfare reform from the late 1970's to 1998. The study will use variation across time and States to disentangle the effects.	**$96,807**
The Effects of Welfare Implementation on Food Stamp Caseloads **Research Foundation of State University of New York**	To examine local-level institutional changes in program delivery that may have contributed to caseload decline for the Food Stamp Program. The study focuses on such changes as the growing institutional separation between food stamp and cash welfare administrative systems and the increasing complexity of the programs.	**$200,079**
Causes and Consequences of Food Insufficiency After Welfare Reform **University of Michigan**	To examine the experiences of single mothers and their children in the era since welfare reform. The study focuses on such outcomes as food insufficiency and maternal and child health, and relates them to maternal work histories and welfare and food stamp participation.	**$200,354**
Devolution and Urban Change **Department of Health and Human Services**	To incorporate a Food Stamp Program (FSP) component into a major analysis by Manpower Demonstration Research Corporation of the effects of welfare reform on the economic and social well-being of low-income families in four urban areas. The study will examine issues such as local office implementation of national FSP policies, how recipients fare, whether local institutions are affected by changes in welfare policies, and how changes are evidenced by indicators of well-being.	**$300,000**

Fiscal 1999 Research Projects/Award	Objective	Estimated Cost
Better Serving the Working Poor		
Improving Access to Food Stamps for Low-Income Working Households **Manpower Demonstration Research Corp.**	To examine food stamp use among low-income working households, a group for which the number of eligible households substantially exceeds the number of participating households. Data will involve longitudinal information on food stamp benefits, food sufficiency, material hardship, and child well-being.	**$178,433**
Restructuring Food Stamps To Help Working Families **Urban Institute**	Building on various analyses related to the New Federalism Project, this study will explore and propose options for restructuring the Food Stamp Program to supplement the incomes of working, low-income families.	**$50,000**
Program Integrity and Improved Service to the Working Poor Under Alternative Reporting Plans **The SPHERE Institute**	To compare retrospective monthly earnings reporting and prospective quarterly reporting to determine which best serves the working poor, yields administrative cost-savings, and preserves program integrity.	**$348,428**
Nutrition and Health Outcomes and Dietary Behavior		
Understanding Child Nutrition in the Year 2000: Dynamic Shifts and Their Determinants **University of North Carolina**	To examine factors that affect the quality of children's diets, including snacking behaviors, away-from-home food intake behavior, the role of maternal labor force participation, and the influence of food and nutrition assistance programs.	**$200,000**
Obesity in Low-Income Mothers and Children **Children's Hospital Medical Center**	Using links between WIC data and birth certificate data on approximately 35,000 mother-child pairs, the study will examine factors that may influence the probability that by age 4 a WIC child with an obese mother will also be obese.	**$350,000**
Factors Affecting Child Obesity Among Low-Income Households **University of Georgia**	Using data from USDA's 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII) and a statistical technique to correct for selectivity bias, the study is designed to ascertain if children from low-income households that participated in food assistance programs are at a greater risk of becoming obese than are their counterparts.	**$99,828**

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Fiscal 1999 Research Projects/Awards	Objective	Estimated Cost
The Determinants of Overweight and Obesity Among Low-Income Children **Boston University, Boston Medical Center**	To examine the relationships between food insufficiency and obesity among low-income children. Using data from the National Health and Nutrition Examination Survey (NHANES III), the study will examine the impact of household food insufficiency status and other factors on the likelihood of being overweight for children whose families receive WIC or food stamps compared with children in nonrecipient households.	**$124,999**
Economic Benefits of a Breastfeeding Promotion: A Controlled Clinical Trial **Albert Einstein College of Medicine**	To evaluate the benefits of a breastfeeding promotion intervention campaign among low-income women. A randomized controlled clinical trial will examine the effects on breastfeeding prevalence and duration, infant health, and infant medical costs of providing the mother with personalized breastfeeding counseling.	**$399,700**
Food Security and Health Outcomes in the California Health Interview Survey **University of California—Los Angeles School of Public Health**	To adapt the USDA Food Security Core Module for use with different ethnic populations participating in the California Health Interview Survey. The survey investigates the relationship of household-level food insecurity and hunger to self-reported health status, health services utilization, dietary quality, and preventative health behaviors.	**$100,000**
Evaluating the Impact of School Breakfast on Learning: Design and Feasibility **Mathematica Policy Research**	To develop and evaluate alternative study designs that would permit future evaluation of the impact of school breakfast on learning and cognitive development. The research will identify the strengths and weaknesses of alternative designs and address such critical issues as controlling for confounding factors.	**$289,311**
Food Security		
Hunger: Its Risk and Impact in Poor Female-Headed Households With Children **University of Massachusetts Medical School**	To identify factors that predispose poor households to, or protect them from, food insecurity and hunger. The study will examine the impact of food insecurity/hunger on a variety of measures, such as food insecurity, physical and emotional health of mother and children, and children's academic achievement.	**$250,000**
Food Security Measurement Research **IQ Solutions**	To analyze for the 1995-99 period the extent of food insecurity and hunger in the United States, using data collected in the Food Security Supplements to the Current Population Survey (CPS) conducted by the Census Bureau.	**$236,859**

Fiscal 1999 Research Projects/Award	Objective	Estimated Cost
Community Food Security Assessment Conference **USDA Graduate School**	To contribute to the Department's Community Food Security Initiative by supporting the development of a standardized community assessment toolkit and sponsoring a conference that gathered an interdisciplinary group of academics and community practitioners from across the country to help guide the development and implementation of the assessment toolkit.	**$127,032**
Community Food Security Assessment Toolkit **IQ Solutions**	To develop a set of standardized instruments for the measurement and assessment of community food security. The menu of instruments will be accompanied by implementation descriptions that will facilitate data collection and analysis at the local level.	**$149,570**
Program Integrity and Effectiveness		
WIC Cost Containment Study **(Congressionally mandated)** **Abt Associates, Inc.**	Report to Congress on the effects of cost containment practices by States of limiting brand-named products in the WIC food package and promoting more stringent selection of vendors. The study will assess the effects of such practices on program participation, access to and availability of prescribed foods, voucher redemption rates, actual food selections by participants, participants on special diets or with specific food allergies, participant use of and satisfaction with prescribed foods, achievement of positive health outcomes, and program costs.	**$1,099,273**
WIC Program Integrity Research **ATMS/Abt Associates, Inc.**	To identify and evaluate the best tools for detecting fraud and abuse among WIC staff or participants. The study will review existing tools and data systems presently in use by some States for detecting fraud and abuse among WIC vendors. The project was identified by the National Association of WIC Directors as a high research priority.	**$225,550**
Summer Food Service Evaluation: Design, Cost, and Evaluation **Mathematica Policy Research**	To obtain a design, cost, and evaluation study that considers options for improving estimates of sponsor, site, and participant characteristics in the Summer Food Service Program. The study will consider alternative sampling frames, questionnaire design, modes for collecting information, time frames for data collection, and implications for implementation costs.	**$412,245**

Fiscal 1999 Research Projects/Award	Objective	Estimated Cost
Research Outreach		
Small Grant Research Programs	To stimulate new and innovative research on food assistance programs and to broaden the participation of social science scholars in food assistance research. Five Small Grant Programs were established in fiscal 1998 at academic institutions and affiliated research institutes. Each program focuses on a particular facet of food assistance, such as diet and health outcomes, relationships to poverty and well-being, rural issues, and special at-risk population groups. The five institutes and areas of focus are: • The Joint Center for Poverty Research, University of Chicago and Northwestern University funded proposals on interactions between food assistance and other welfare programs, and linkages between the macroeconomy and food assistance. ($150,000) • The Southern Rural Development Center at Mississippi State University supports food assistance research on rural people, families, and communities in the South. The Center also initiated a dialogue among scholars through the establishment of a Rural South Food Assistance Research Task Force, with the purpose of further articulating research priorities on food-assistance-related issues. ($150,000) • The University of Arizona, American Indian Studies Program is working with scholars at tribal colleges and elsewhere to support research addressing the unique issues and problems of Native Americans with respect to food assistance. ($150,000) • The University of California at Davis, Department of Nutrition has awarded small grants for research on the impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity. This program seeks to encourage examinations of multiple indicators of nutrition impact, and interdisciplinary approaches integrating epidemiology, economics, or anthropology with nutrition. ($150,000) • The Institute for Research on Poverty at the University of Wisconsin awarded research grants that address the effects of food assistance on individual and family wellbeing and food security. ($150,000)	**$750,000**
Food and Nutrition Information Center (FNIC) National Agricultural Library	To provide support to the National Agricultural Library (NAL) in systematically storing and disseminating information on USDA's food assistance programs, nutrition education, and related nutrition issues; and hosting a website and list server.	**$200,000**

Fiscal 1999 Research Projects/Award	Objective	Estimated Cost
Improving Measurement of Health and Nutrition Outcomes **Department of Health and Human Services**	To promote understanding of the proper methods for assessing health- and nutrition-related outcomes for food assistance programs. ERS will support NAS research on how the newly developed Dietary Intake References should be incorporated into program design and evaluations.	**$100,000**
Rural Dimensions of Welfare Reform Conference **Joint Center for Poverty Research, University of Chicago and Northwestern University**	To assemble experts who will present research papers on poverty, welfare and food assistance that have a rural or rural/urban comparative dimension, reflecting the fact that most poor and welfare-recipient families live outside of central cities and that substantial minorities live outside of metropolitan areas altogether.	**$100,000**
Committee on National Statistics **National Science Foundation**	To provide funding for the Committee on National Statistics for such activities as a review of the 2000 Census, poverty estimates for small areas, measuring the effects of social welfare reform, cost-of-living indexes, performance measures for public health programs, the use of statistical formulas in legislation for fund allocation, confidentiality and data access, and other issues.	**$26,200**
Food and Nutrition Summer Institute **Agricultural Research Service**	To help sponsor the Food and Nutrition Summer Institute, which has the objectives of positioning the nutrition programs of historically black colleges and universities to meet research and education challenges, and of creating a stronger voice and action for nutrition education, research, and policy within the African American community.	**$20,000**
Enhanced Food Assistance Research Data		
National Food Price Data System Enhancement **Food and Drug Administration**	To expand a national database of food prices, quantities, and comparable volumes and dollars sales at the product group, class, brand, and item levels to include information on which items received various types of local promotional treatments.	**$6,000**
Panel Study of Income Dynamics **National Academy of Sciences**	To sustain and improve the collection of food assistance data in the Panel Study of Income Dynamics (PSID). The PSID collects longitudinal data on family composition, income, use of public assistance, food security, and factors associated with family self-sufficiency.	**$104,500**
Early Childhood Longitudinal Studies (Birth Cohort) **Department of Education**	To include USDA's food security module and other items in the Early Childhood Longitudinal Survey—Birth Cohort, sponsored by the National Center for Educational Statistics, U.S. Department of Education. The survey was pre-tested for nine-month-old children, gathering infant height and weight data as well as responses to questions on food security, infant feeding practices, and participation in food assistance programs.	**$150,000**

Fiscal 1999 Research Projects/Award	Objective	Estimated Cost
Measuring Food Security: April 1999 Food Security Supplement to the Current Population Survey **Census Bureau**	To sustain annual collection of data on the prevalence of food security in the United States and to provide data for analysis of the determinants of, and changes in, the level of food security.	**$440,000**
National Health and Nutrition Examination Survey **Department of Health and Human Services**	To improve the measurement of food security for individuals as part of the *National Health and Nutrition Examination Survey (NHANES)*, which collects data on diet, food consumption, and health status.	**$125,000**

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Table 2
FANRP Extramural Research Studies: Fiscal 1998

Research Projects/Award	Objective	Estimated Cost
Welfare Reform		
Family Child Care Homes Legislative Change Study (*Congressionally Mandated*) **Abt Associates, Inc.**	Report to Congress on the effects of the new tiered meal reimbursements for family child care homes participating in the Child and Adult Care Feeding Program (CACFP) on sponsoring organizations, participating and dropout homes, and children.	**$1,959,007**
Report to Congress on State Use of Funds To Increase Work Slots for Food Stamp Recipients (*Congressionally Mandated*) **Health System Research**	Report to Congress on the implications of the increased size of the Food Stamp Employment and Training (E&T) Program on participants, especially on unemployed able-bodied adults without dependents (ABAWDs) and descriptions of how States use E&T funds and recent changes in participation.	**$291,609**
Report to Congress on Use of Food Stamps To Purchase Dietary Supplements (*Congressionally Mandated*) **Life Sciences Research Organization**	Report to Congress assessing the state of scientific knowledge regarding the potential value of vitamin and mineral supplements in filling nutrient gaps and the comparative impact of vitamin and mineral supplements, improved diets, and the intake of fortified foods on health status and health care costs.	**$120,250**
Expanded Study of Welfare Reform on Immigrants Department of Health and Human Services	Determine the economic, social, nutritional, and health effects of changes in food stamp eligibility and other aspects of welfare reform on immigrants, their households, and communities. Interviews of households that were in the Urban Institute's National Survey of American Families will provide longitudinal information and a check on retrospective information on food stamp receipt, food security, and their relationship to economic, social, nutritional, and health outcomes.	**$300,000**
Food Program Targeting and Delivery Mathematica Policy Research, University of Michigan, Urban Institute	To evaluate the success of USDA's food assistance programs at servicing needy, at-risk populations, including examination of food program gaps and overlays, characteristics of food assistance recipients after welfare reform, behavior of low-income households, and urban-rural delivery.	**$677,000**

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Fiscal 1998 Research Projects/Award	Objective	Estimated Cost
Temporary Assistance to Needy Families (TANF) – Leavers Use of Food Stamps **Department of Health and Human Services**	Determine the status of TANF recipients after they leave the TANF caseload, eligible families who are diverted before being enrolled in TANF, or eligible families who fail to enroll in TANF. The analysis will include former recipients/eligibles participating in the Food Stamp Program and the role that food stamps play in their overall wellbeing with particular focus on former recipients/eligibles that reside in nonmetropolitan areas. The analysis will address individuals ability to obtain employment and the support provided by their earnings, public programs besides TANF and food stamps, and other programs.	**$250,000**
Studies of Households Who Leave the Food Stamp Program **Abt Associates, Inc., Mathematica Policy Research, Iowa State University, and South Carolina Social Services**	Determine the status of households and individuals who leave the Food Stamp Program. Of particular interest are able-bodied adults between the ages of 18 and 50 without dependents, (ABAWDs) because the Food Stamp Program changes were the strictest for this group. The analysis will focus on individuals' ability to obtain employment, the support provided by their earnings and other income sources, and support provided by public and/or private programs.	**$1,498,074**
A Study of U.S. Emergency Food Assistance System: Provider and Recipient Characteristics **Mathematica Policy Research**	To develop an understanding, through a nationally representative sample, of the characteristics, operating structure, and service areas of food banks, food pantries, and emergency kitchens and to provide national estimates of the total number of recipients served and the total quantity and type of food by source. This study provides policymakers a better understanding of the resource base of food banks, food pantries, and emergency kitchens and the capacity of these providers to manage current and future changes in food demand and food resources.	**$1,493,061**
A Study of Changes in Food Stamp Program Administration Processes Related to Welfare Reform **Health System Research**	To study the extent and nature of States' welfare administrative re-engineering efforts as they affect the Food Stamp Program administrative processes. These include changes associated with welfare reform that effect either the interaction between food stamp applicants and caseworkers or the efficiency or the integrity of the program. The focus of the study will be on those parts of the States' administrative practices that are innovations to or departures from prior practices.	**$362,443**
Research Linking Food Assistance Programs, Agriculture, Rural Areas, and the Economy **Iowa State University, University of Oregon, and Mathematica Policy Research**	To examine the linkages between food assistance programs and the general economy. In particular, to examine the characteristics of the welfare assistance packages being developed at the State level and assess the impact they may have on Federal food assistance program participation rates and expenditures.	**$672,399**

Fiscal 1998 Research Projects/Award	Objective	Estimated Cost
Simplified Food Stamp Program Technical Assistance **Mathematica Policy Research**	To conduct microsimulations and related analyses of alternative State-level changes to program options in the Simplified Food Stamp Programs. To evaluate the potential effects on program eligibility, participation, benefit levels, and costs.	**$88,389**
Food Security		
Measuring Food Security: August 1998 Current Population Survey Supplement **Census Bureau**	To develop annual estimates of the prevalence of food security in the United States and to provide data for analysis of the determinants of and changes in the level of food security.	**$440,000**
Early Childhood Longitudinal Survey--Kindergarten Cohort **Department of Education**	To include USDA's food security module and other items in the Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K), sponsored by the National Center for Educational Statistics, U.S. Department of Education. The project will provide descriptive data on children's status at entry into school, children's transition into school, participation in the School Breakfast and National School Lunch Programs, and children's progress through fifth grade--including data that allow for the examination of the relationship between food security/hunger, cognitive development and school performance.	**$500,000**
Panel Study of Income Dynamics (PSID) **National Academy of Sciences**	To improve the collection of longitudinal data on family composition, income, use of public assistance, food security, and factors associated with family self-sufficiency on the Panel Study of Income Dynamics (PSID). To develop and modify survey questions to improve estimates of food expenditures, participation in food assistance programs, expenditures on major consumer goods and services, nutritional behavior, and the calculation of food stamp eligibility.	**$444,830**
Research To Strengthen and Improve Measures of Food Security **Iowa State University**	To improve the measurement of food security and hunger at the household level by: (1) assessing changes in food security prevalence over time; (2) investigating alternative approaches for measuring food security items and classifying households into food security categories; and (3) developing and field-testing a set of questions for future modifications of the food security scale.	**$200,000**

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Fiscal 1998 Research Projects/Award	Objective	Estimated Cost
Nutrition and Health		
WIC and Childhood Development: Early Childhood Longitudinal Survey, Birth Cohort 2000 **Department of Education**	To support enhanced data collection necessary to examine the link between WIC participation in infancy and childhood to cognitive development, obesity, and food security by adding a bank of questions to the Early Childhood Longitudinal Study--Birth Cohort (ECLS-BC), conducted by the National Center for Educational Statistics (NCES), U.S. Department of Education. Added questions include information on WIC and other food assistance program participation, infant feeding practices, health care, height, weight, and related information.	**$200,000**
Dietary and Nutrition Outcomes **Harvard School of Public Health and Research Triangle, Inc.**	To develop and evaluate dietary assessment tools for young children that can be used in WIC program centers, recognizing that adaptations may be needed for culturally diverse populations. The tools will serve several functions, including screening for dietary patterns that do not meet Federal dietary recommendations, facilitating the triage of patients for services, and serving as the basis for general nutrition education.	**$989,149**
Research To Assess Links Between Diet Quality and Health **Harvard School of Public Health**	To analyze and improve our understanding of the relationship between diet quality and health status over time and to determine whether overall measures of diet quality such as the USDA Healthy Eating Index (HEI) predict the occurrence of adverse health outcomes (such as cardiovascular disease, cancer, or death).	**$100,000**
Research on Breast-fed Infants' Growth **World Health Organization**	To conduct research on optimal growth rates for breastfed infants. WIC program clinicians require appropriate infant growth charts to determine when, and if, breastfeeding should be supplemented with formula to support weight gain. Current infant growth charts are based predominately on formula-fed infants and, hence, may suggest faster weight gains than optimal, leading to unnecessary formula supplementation.	**$800,000**

Fiscal 1998 Research Projects/Award	Objective	Estimate Cost
Program Integrity and Effectiveness		
Assessment of Computer Matching in the Food Stamp Program **Mathematica Policy Research**	To examine how States are currently using or planning to use computer-matching strategies to reduce fraud and abuse in their food stamp and other assistance programs. By collecting and disseminating information on computer matching, this project will help States improve program integrity and support FNS oversight to ensure that States manage the FSP as efficiently as possible.	**$342,269**
The Evaluation of Electronic Benefits Transfer (EBT) Customer Service Waivers on Recipients **Abt Associates Inc.**	To identify and estimate the occurrence of client service problems associated with EBT customer service waivers, and assess clients respond.	**$647,255**
Nutrition and Health Outcomes of USDA Food and Nutrition Assistance Programs **Abt Associates Inc.**	To improve and expand understanding of the effects of USDA's food and nutrition assistance programs on food consumption, nutrient availability and intakes, dietary quality, nutritional status, and health outcomes.	**$526,358**
WIC Supplemental Food Package Analysis **Center for Nutrition Policy and Promotion, USDA**	To review and assess how well the WIC food packages that are currently offered to pregnant and lactating women, infants, and children meet supplementation needs of the target populations.	**$76,000**

Fiscal 1998 Research Projects/Award	Objective	Estimated Cost
Research Outreach		
Small Grant Research Programs	To stimulate new and innovative research on food assistance programs and to broaden the participation of social science scholars in food assistance research. Five small grant programs have been established at academic institutions and affiliated research institutes. Each program focuses on a particular facet of food assistance, such as diet and health outcomes, relationships to poverty and well-being, rural issues, and special at-risk population groups. The five institutes and areas of focus are: • The Joint Center for Poverty Research, University of Chicago and Northwestern University funded proposals on interactions between food assistance and other welfare programs, and linkages between the macroeconomy and food assistance. ($262,740) • The Southern Rural Development Center at Mississippi State University to conduct food assistance research on rural people, families, and communities in the South. The Center also initiated a dialogue among scholars through the establishment of a Rural South Food Assistance Research Task Force, with the purpose of further articulating research priorities on food assistance-related issues. ($222,000) • The University of Arizona, American Indian Studies Program is working with scholars at tribal colleges and elsewhere to support research addressing the unique issues and problems of Native Americans with respect to food assistance. ($246,224) • The University of California at Davis, Department of Nutrition has awarded small grants for research on the impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity. This program seeks to encourage examinations of multiple indicators of nutrition impact, and interdisciplinary approaches integrating epidemiology, economics, or anthropology with nutrition. ($225,024) • The Institute for Research on Poverty at the University of Wisconsin awarded research grants that address the effects of food assistance on individual and family wellbeing and food security. ($234,834)	**$1,190,851**
Food and Nutrition Information Center (FNIC) **National Agricultural Library**	To provide support to the National Agricultural Library (NAL) in systematically storing and disseminating information on USDA's food assistance programs, nutrition education and related nutrition issues; and hosting a website and list server.	**$110,000**
Second National Conference on Food Security Measurement and Research **IQ Solutions**	To bring together experts on food security measurement—providing direction for future research needs and data collection, such as measurement of individual food security, and analyzing the refinement, validation, and use of the USDA/DHHS food security measurement scale.	**$100,000**

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Fiscal 1998 Research Projects/Award	Objective	Estimated Cost
Policy Research		
WIC General Analysis Project (GAP) **Food and Nutrition Service, USDA**	To conduct research and analysis of the WIC Program to support program and policy decisions, including research on (1) estimates of WIC eligibility, (2) changes in WIC participant characteristics over time, and (3) nutrient, health risk, and demographic characteristics of WIC participants and eligible nonparticipants.	**$560,000**
Microsimualtion and Related Analyses **Food and Nutrition Service, USDA**	To provide the simulations and related technical expertise needed to estimate the impact of proposed changes to the FSP. Other objectives include: maintaining and improving microsimulation capabilities, preparing databases, and conducting supporting research.	**$778,628**
Child Nutrition Analytic Projects(CNAP) **Food and Nutrition Service, USDA**	To conduct research and analysis of USDA's child nutrition programs to support program and policy decisions, including research on (1) food and nutrient intake of school-age children, and (2) the contribution of child nutrition programs to food and nutrient intake.	**$460,000**
Extent of Trafficking in the Food Stamp Program After Welfare Reform **Macro International**	To update estimates of food stamp trafficking using current data and to provide longitudinal comparison of the prevalence of trafficking before and shortly after initial implementation of welfare reform.	**$199,921**
Enhanced Data Developiment		
Continuing Survey of Food Intake by Individuals (CSFII) **Agricultural Research Service, USDA**	To improve estimates of low-income household food consumption in the United States by increasing the sample size of low-income individuals in the *Continuing Survey of Food Intake by Individuals (CSFII)* and developing and modifying survey questions related to food assistance programs.	**$1,250,000**
National Health and Nutrition Examination Survey (NHANES IV) **Department of Health and Human Services**	To collect data on diet, food consumption, and health status as part of the *National Health and Nutrition Examination Survey (NHANES)* by developing and modifying survey questions to improve the measurement of the relationship between diet and health for low-income individuals.	**$100,000**
National Food Price and Sales Information System **Food and Drug Administration**	To purchase the most recent nationally reliable data on food prices, quantities, comparable volumes, dollar sales, and promotion information at the product group, class, brand, and item levels. The data system includes information on vitamin and mineral supplements.	**$235,000**

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Mr. Skeen: You indicated in last year's hearing record that further study would be done to ascertain the factors effecting adoption rates of pest management practices. Have you had an opportunity to study this? If so, what have you found?

Response: This issue has been studied for several crops, and the factors affecting adoption rates of pest management practices vary depending on the type of crop being produced and the location of production. ERS is currently planning a follow up report to *Pest Management in U.S. Agriculture* (Agricultural Handbook 717), referred to in question 6, that will include a discussion of this issue.

Mr. Skeen: Have you had the opportunity to further analyze the adoption of nutrient, soil and water management technologies related to pest management practices? If so, what have you found?

Response: ERS has examined the interaction among nutrient, soil, water, and pest management practices using data from two sources: the Area Studies Survey (1991-1993) and the Agricultural Resource Management Study (ARMS) (1996).

The Area Studies Survey data was used to examine whether the adoption of selected nutrient, soil, water, and pest management practices had an effect on chemical use or on crop yields. We found that, in general, the adoption of improved technologies results in little reduction in chemicals used, and slight yield increases.

The ARMS data was examined with a focus on how pesticide and fertilizer use changes with farm-level adoption of alternative tillage, irrigation, and nutrient management practices. With these data, we found few statistically significant differences in per-acre applications of nutrients and pesticides, but those that are observed are consistent with expectations. Per-acre herbicide use is greatest under no-till tillage systems that depend on chemical herbicides in place of mechanical weed control. Irrigation methods make little difference in per-acre chemical use. Reductions in per-acre commercial fertilizer applications are consistent with improved nutrient management practices.

Mr. Skeen: The National Research Council report was scheduled to be released on March 30, 1999. Was the report released? If so, please provide a copy of the report for the record. Please summarize the findings for the Committee.

Response: The NRC report has been released and a copy is provided for the record. The summary of findings follows: **[Clerk's note: The attachments were deemed too lengthy for printing and have been retained in Committee files.]**

The NRC report, entitled "Sowing Seeds of Change: Informing Public Policy in the Economic Research Service of USDA," addressed several key aspects of ERS operations.

With respect to program evaluation, the NRC noted the need for formal instruments that allow its clients to assess the performance and suitability of ERS for any given analytical task or service. The agency helps design these instruments but does not administer them. The panel's recommendations for evaluation of the performance of its scientists are consistent with recent changes at the agency, which emphasize peer and client review of accomplishments.

ERS also sought the NRC's advice on how to balance the allocation of funding between intramural and extramural work. Given the ever-broadening scope of its work and the reality of its budget, ERS recognizes the need to acquire research from a range of sources, including its traditional partners in the land-grant university system. The NRC endorsed the notion of competition in the supply of economic research and analysis and suggested ways that ERS could expand its extramural program, much along the lines of its recent approach to addressing key issues in USDA food assistance and nutrition programs.

The findings of the NRC study committee, chaired by John Geweke of the University of Minnesota, reflect an appreciation for the difficult environment ERS faces. First, the range of issues that ERS must address transcends its traditional focus on production agriculture and mirrors USDA's broadening mission to address environmental quality and consumer needs. Second, the tightening of Federal spending and emphasis on Federal agency accountability through the Government Performance and Results Act present ERS with a need to adopt methods of evaluation that help it allocate scarce resources. Third, the NRC findings clearly point to the complementary nature of ERS research, secondary data analysis, and short-term staff work and the need to maintain balance in its program. And fourth, the work of ERS is seen as being most credible and useful when it is successful in anticipating the policy issues of the day, a task which requires both foresight and awareness.

Mr. Skeen: Last year, you reported that ERS has been an integral part of USDA's Asian Crisis Task Force, but that the crisis has taken on more of a global face. As a result, for fiscal years 1999/2000 your focus was/is going to be on: (1) analyzing the spread of the financial crisis to agriculture; (2) developing an analytical framework that specifies the linkages between the macroeconomic and financial economy and agriculture; and (3) analyzing the effects of the volatility of international financial markets on agricultural commodity trade. Have you had the opportunity to explore these areas? What have you found? What other USDA agencies are part of this task force?

Response: USDA's Asian Crisis Task Force ended in 1998 when the Asian crisis stabilized and the Task Force completed its analysis as reported last year. The Office of Chief Economist, the Foreign Agricultural Service, and ERS were represented on the Task Force. The international financial upheaval that began in Asia in July 1997, and subsequently spread to other countries, set back economic growth and trade worldwide. World economic growth slipped from 3.2 percent in 1997 to 1.6 percent in 1998. Currencies in Indonesia, Thailand, South Korea, Russia, Brazil, and other Latin American countries depreciated 35-75 percent, growth contracted 2-14 percent, and interest rates rose 6-47 percent. While the value of Asian currencies stabilized and interest rates came down, Asian economies continued to contract through the end of 1999. After 2 years of setbacks, some crisis economies turned the corner in 1999. Leading the way to recovery are South Korea and Thailand.

Results from ERS research on the international financial crises are included in *International Financial Crises and Agriculture: International Agriculture and Trade Report*, USDA, WRS-99-3, March, 2000. The research concluded that currency depreciation helped agricultural producers, but hurt consumers in the crisis countries. The lower currency values that enhanced

primary agricultural production and reduced imports improved the agricultural trade balance of the crisis countries. Non-crisis countries, including the United States, China, and Japan were affected as well. Capital flight from the crisis countries helped keep U.S. interest rates low, stimulating investment and boosting growth. In addition, the financial turmoil and depressed global commodity prices reduced U.S. agricultural exports and lowered import costs, keeping inflation in check but narrowing the agricultural trade surplus.

On-going ERS research on global financial volatility indicates strong impacts of exchange rate risk on specific commodity exports but not on aggregate exports.

Mr. Skeen: The Resource Economics Division provides research and analyses to support the implementation of USDA conservation programs. Through that work, have you been able to determine if USDA conservation programs are effective, efficient and equitable? Please explain.

Response: ERS has not attempted to evaluate conservation program performance. Nevertheless, several recently completed and ongoing projects have provided information, analysis, and support useful to USDA efforts to increase the effectiveness and efficiency of Departmental conservation programs. Two such activities included work on environmental targeting and on conservation tillage components of the program.

Environmental targeting is the practice of directing program resources to lands where the greatest environmental benefit is generated for a given expenditure, or alternatively, specific environmental goals are achieved for the least cost. The current CRP targeting method is a land-scoring method known as the Environmental Benefits index (EBI). The EBI superseded the approach used prior to 1990, which targeted lands based on soil erodibility. ERS research has found that switching CRP targeting criteria from erodibility to the EBI approximately doubled the benefits of freshwater-based recreation and wildlife viewing. Also, by giving residents relatively easy access to natural resources, targeting the CRP to lands that are located near populated areas could also increase the benefits of several types of outdoor recreation. (Source: Economic Valuation of Environmental Benefits and the Targeting of Conservation Programs, AER No. 778, April 1999).

[Clerk's note: The attachments were deemed too lengthy for printing and have been retained in Committee files.]

Increasingly, farmers are adopting conservation tillage practices that reduce soil erosion and, ultimately, runoff that is detrimental to water quality. These practices are often part of farm conservation plans required for eligibility for Federal farm program benefits on farms that have highly erodible cropland. ERS research has found that adoption of conservation tillage practices can improve water quality and augment the enjoyment of water-based recreational activities. In fact, the water-based recreational benefits of conservation tillage are large in comparison to those generated by the CRP. (Source: Recreational Benefits from Conservation Tillage on U.S. Cropland, by Peter Feather, Merritt Padgitt, and Carmen Sandretto).

Mr. Skeen: Please tell the Committee how the $800,000 for global climate change was used in fiscal year 1999.

Response: The ERS Global Resources and International Environmental Issues program has been

earmarked at $800,000 per year. In fiscal 1999 ERS allocated about $350,000 to the Climate Change Mitigation Project, which examines impacts on U.S. agriculture of possible greenhouse gas (GHG) mitigation policies, and the potential of agriculture to contribute to meeting possible commitments to reduce GHG emissions. Last year, this project supported the May 1999 USDA analysis requested by Senate Agriculture Committee members, Economic Analysis of U.S. Agriculture and the Kyoto Protocol, estimating potential costs and benefits to U.S. agriculture from compliance with the Kyoto Protocol. ERS allocated $200,000 to the Climate Change Impacts Project, which analyzes potential effects of climate change on agricultural production, land-use change, and ecosystem diversity from a global perspective.

ERS allocated the remaining $250,000 to two projects. The Sustainable Resource Use project examines humankind's ability to satisfy increasing demands for agricultural and environmental goods and services without permanently damaging the world's natural resource base. The Trade and Environment project investigates issues including: 1) the extent to which domestic and multilateral environmental regulations or agreements might impact U.S. commodity production and trade, and 2) the extent to which trade agreements might impact U.S. environmental conditions.

Mr. Skeen: In fiscal years 1999 and 2000, ERS received a $453,000 appropriation for the report "Estimating the Benefits of Food Safety." In fiscal year 1999, ERS allocated $273,000 for cooperative agreements or contracts to carry out part of the work. Are you planning the same with the fiscal year 2000 and 2001 funds? How much of the work will be conducted in-house?

Response: Last year we estimated that from the FY 1999 appropriation of $453,000 a total of $273,000 would be allocated for competitively selected cooperative research agreements, with the balance of the appropriation allocated to salary costs for ERS staff collaborating on the projects, purchase of data on the medical costs of foodborne disease, and travel. At the time we responded to your question last year, the final awards had not yet been granted. Two competitively selected grants were awarded to Harvard University and the University of Wyoming to develop national estimates of the benefits of improving the safety of the Nation's food supply. The total funding for these two projects came to $291,678. These research projects are applying state-of-the-art valuation methodologies to measure consumers' "willingness to pay" for reductions in food safety risk from microbial pathogens.

In FY 2000 we do anticipate funding additional extramural research on the benefits of safer food at approximately the same level as in FY 1999. This new work would build on research findings from projects funded in FY 1999. If funds are available in FY 2001, we anticipate funding extramural research at about that level for a third year. ERS economists actively collaborate with the external cooperators on assessing benefits of food safety and have an important role in guiding and managing the extramural program. We estimate that approximately two-thirds of the work on food safety benefits in FY 2000 and FY 2001 will be conducted in-house. Final completion of this series of annual studies on the benefits of safer food is anticipated by 2002.

Mr. Skeen: Why are you requesting another $453,000 in fiscal year 2001 for this same study? Was this always intended to be a multiyear project? When is the proposed end date for this

report and when will the final report be issued?

Response: We are not requesting an increase of $453,000 for the FY 2001 budget for estimating the benefits of safer food. The request is to continue funding for this critical area of research at the higher base level established in FY 1999 and continued in FY 2000. As discussed in our response to Question 41, we anticipate a series of annual studies, contingent on funding, starting in FY 1999 and ending in FY 2001. The final report on the national benefits of safer food will be issued in FY 2002.

Mr. Skeen: I noticed in your geographic breakdown of obligations and staff years that the largest amount of obligations, outside of Washington, D.C., occurs in Massachusetts. Why is this?

Response: ERS competitively awarded two contracts to Abt Associates Inc. totaling $2.99 million for analysis of Food Stamp Program caseload declines and a legislatively mandated study of WIC cost containment practices. In addition, one grant and one cooperative agreement totaling $0.375 million were competitively awarded to Boston Medical Center and University of Massachusetts Medical School.

Mr. Skeen: Please provide for the record year-to-date obligations, by state, as of February 29, 2000.

Response: A year-to-date actual breakdown is provided for the record.

Economic Research Service
Geographic Breakdown of Obligations
2000 Year-to-Date Actual
As of February 29, 2000

	Dollars
Arizona	198,000
California	164,000
District of Columbia	17,380,347
Florida	19,000
Iowa	9,000
Massachusetts	932,884
Minnesota	30,000
Montana	5,000
New York	6,000
Pennsylvania	50,918
Total	18,795,149

Mr. Skeen: Does the $477,526 in unobligated balance return to the U.S. Treasury?

Response: ERS reported that this balance was unobligated at the end of fiscal year 1999. ERS is planning to return this balance to the Treasury in five years when the fiscal year 1999 appropriation is closed out.

Mr. Skeen: According to the object class table, object class 21 travel, increases by nearly $300,000 in fiscal year 2001. What is the reason for this 50 percent increase in travel?

Response: The increase in travel in fiscal year 2001 is part of the requested increase in funding for the structural change and the global research initiatives. The travel budget in the structural change initiative will largely accommodate bringing in visiting scholars to participate in ERS workshops and seminars, and to engage in joint research efforts with individuals from ERS. It will also enable researchers from ERS to visit various universities and attend workshops and conferences around the country.

Under the global research initiative, conducting research in other countries in collaboration with economists from those countries will require considerable travel by both the U.S. and foreign economists. Some activities will require that participants in projects remain in temporary duty stations for periods of several weeks or months. Joint activities involving economists from less developed country institutions will regularly involve on the job training for the foreign economists in ERS in Washington DC.

Mr. Skeen: Why does the fiscal year 2001 appropriations language propose to delete the $1,000,000 transfer to the Food and Nutrition Service?

Response: The President's fiscal year 2001 appropriation request has proposed to transfer the entire studies and evaluation budget for food assistance programs to the Food and Nutrition Service. Consequently, there is no request to transfer the $1,000,000 from the Economic Research Service to the Food and Nutrition Service for FY 2001.

Mr. Skeen: How would ERS use $700,000 if the request were approved for carbon sequestration? Is this work being coordinated with any other USDA or federal agencies? If so, which ones and to what extent has the work been coordinated?

Response: ERS would initiate three kinds of activities: The first would address the ERS project *Economic Potential for Domestic Carbon Sequestration and Trace Gas Control in Agriculture.* The funding would support the third of a three-year cooperative study with the Natural Resource Ecology Laboratory in Colorado. USDA's Fund for Rural America funded the first two years of this project, which is evaluating the potential of carbon as a commodity for U.S. farmers.

The second ERS project, *Economic Incentives for Carbon Sequestration*, would study how impacts on farmers would differ, depending on how such programs are implemented. This would include ways to target programs such as the Conservation Reserve Program (CRP) or Environmental Quality Improvement Program (EQIP) to meet hypothetical trace gas control goals.

The third ERS project, *Global Potential for Agricultural Trace Gas Mitigation and Sequestration,* would extend current research to estimate the potential for mitigation and sequestration policies in a global context. This would support ERS collaboration with researchers around the world in estimating global GHG mitigation and sequestration potential, and what such policies would imply for climate change effects on global and U.S. agriculture.

Mr. Skeen: Why does the administration continue to submit requests for items such as carbon sequestration as they relate to international agreements like the Kyoto Protocol that have never been ratified by the United States Senate?

Response: The U.S. does participate in international agreements and negotiations such as the United Nations Framework Convention on Climate Change (UNFCCC), which has as an objective of stabilization of greenhouse gases (GHGs) at a level that would prevent dangerous human-induced disturbance of the climate system. Interest in the economics of alternative GHG mitigation policies is revealed in the public attention to ongoing UNFCCC negotiations, in legislation introduced into both Houses of Congress, agricultural interest in productivity and financial values of carbon, and elsewhere. ERS responsibilities in its research program and to the USDA global change effort include efforts to quantify tradeoffs, benefits, and costs to inform the public debate regarding possible strategies to mitigate emissions and sequester carbon.

Mr. Skeen: According to last year's hearing record, ERS would only provide "objective analysis for decisionmakers to use" as international agreements such as the Kyoto Protocol are debated. However, according to the justification for a $700,000 increase for this program it states that "several key features that efforts would likely include are: national GHG emission reduction targets, programs to encourage development of emissions-absorbing land "sinks" to sequester carbon, and an emissions permit trading system for meeting emissions reduction targets" independent of the treaty ratification process. Can we conclude that you have moved away from providing objective analysis to a program that may not be as objective as previously stated?

Response: The economic implications for U.S. agriculture of potential greenhouse gas mitigation and carbon sequestration programs depend significantly on the amount of mitigation or sequestration, and the potential policy mechanisms that could be used to achieve these changes. We have observed considerable interest in the public and across the Government in the economics of possible GHG mitigation strategies. ERS is conducting objective analysis designed to be relevant across a wide variety of interests and potential program strategies. Current and planned ERS analysis in this area is directed at informing the U.S. public and policymakers in their evaluation of alternative emission reduction strategies.

Mr. Skeen: Did the ERS include the carbon sequestration initiative in its request to the Department?

Response: No, ERS did not include the carbon sequestration initiative in its request to the Department.

Mr. Skeen: Is it safe to claim the ERS $1.1 million increase for structural changes and concentration in food agriculture contains two broad strategies: (1) identifying market concentration and assessing economic impacts and (2) marketing arrangements and opportunities for farmers? If so, how much of the increase would be spent on each? How would the concentration work you are proposing be different than the work the Grain Inspection, Packers and Stockyards Administration does? How would the marketing arrangements work that ERS is proposing be different than the work the Agricultural Marketing Service does?

Response: Yes, those are the two broad strategies in this initiative. ERS aims to significantly enhance its ability to address the growing issue of concentration and structural change in the entire food system. Actions would involve: (1) determining where and why concentration is occurring in the agricultural marketing chain; (2) examining opportunities and risks for farmers within this kind of market environment; and (3) providing analysis for the USDA and other parts of government regarding structural changes in agriculture.

The increase in budget would be evenly split between strategies. Concentration is occurring throughout the marketing chain, e.g., input suppliers, production agriculture, grain markets, food processing, and wholesale and retail markets. Marketing arrangements like contracting, vertical integration, and various types of strategic alliances have also emerged throughout the supply chain from producers to processors to retailers. For example, some research will examine farmers grain marketing contracts with processors, but to address the effects market arrangements like these on farmers, we will need to know the influence of concentration on as well. Because concentration and changing marketing arrangements are interrelated, analysis of concentration and marketing arrangements must be largely integrated; it is therefore difficult to separately specify expenditures.

ERS research is distinct from Grain Inspection, Packers and Stockyards Administration's (GIPSA) efforts regarding market concentration. GIPSA is a regulatory and enforcement agency while ERS resources are committed to research and analysis. GIPSA addresses livestock and packer issues while ERS addresses all agricultural markets from producers to consumers. It is important to note that structural changes and concentration issues in agriculture are not unique to the livestock sector and are just as prominent in other sectors such as grain processing, food retailing, and others. GIPSA provides some data for ERS and ERS generates analysis and advice for GIPSA.

ERS work on marketing arrangements is distinct from Agricultural Marketing Service (AMS) efforts. AMS forms and administers marketing orders and provides information on prices and characteristics of commodities. ERS research under this initiative will analyze the effects of different marketing arrangements (such as different contracting types, different cash market designs, and vertical integration) on prices paid by consumers and received by farmers. It will also analyze impacts on the investment and work choices of farmers, and on the productivity and growth of the food system. ERS uses some data provided by AMS, and provides research and analysis to AMS on the design of AMS information programs.

This initiative will aid in expansion and targeting of data collection related to changes in market

structure and the identification of small and mid-size farms that are affected by these developments. Current data collection and research will indicate how much of total agricultural production is grown under contract, the distribution of the mix of business strategies used by farmers, and will begin to determine the extent to which economic returns from contract growers differs from participants in the cash market. This research will enhance ERS's ability to measure and analyze changes in concentration and provide assistance to USDA and the Department of Justice regarding potential impacts of concentration and merger activity. Finally, ERS will develop a forward-looking capacity to anticipate significant changes in markets and their potential economic impacts on farmers and consumers.

Mr. Skeen: The fiscal year 2000 consolidated appropriations act contained $4.7 million to implement the new price reporting law. Did the ERS propose to the Department and/or to OMB the use of any of those funds? If so, what was proposed and when did ERS propose it? Please provide a copy of the proposal for the record.

Response: While ERS was aware of the law and its possible implications for its program of work, ERS did not have the opportunity to finalize proposals consistent with Departmental plans. The $1.1 million request for intensified analysis of agricultural concentration did not include any activities to implement the new price reporting law.

Mr. Skeen: Is the ERS conducting any work related to the new price reporting law? What is the cost of that work and is any of it being reimbursed by any other USDA agency?

Response: Subsequent to passage of the law, ERS was asked to develop a plan for implementing the retail price reporting component of the new price reporting law. ERS has been in contact with possible vendors for purchase of retail meat sales data (prices and quantities) in order to assess overall data availability and an estimate of the annual cost for purchase. By the end of March, ERS will submit a detailed implementation plan and cost estimate to the Secretary and to the Department's task group charged with overall implementation of the new price reporting law. ERS has received no commitment for reimbursement from other USDA agencies.

Mr. Skeen: Please provide an object class table for the $1.1 million increase for structural changes and concentration in food and agriculture.

Response: The object class table follows:

Object Class	Dollars
11/12 Salaries and Benefits	250,000
21 Travel	50,000
24 Printing	50,000
25.2 Other Services	50,000
25.5 Research Agreements	656,000

Mr. Skeen: Did the ERS include the $1.1 million increase for structural changes and concentration in food and agriculture in its request to the Department?

Response: Yes, ERS included an increase for an initiative on structural changes and concentration in food and agriculture in its request to the Department. That request was made in advance of the passage of the new price reporting law and did not include funds for the new law's implementation.

Mr. Skeen: Please provide an object class table for the $500,000 increase for global research and outreach initiative proposed in the budget.

Response: The object class table follows:

Object Class	Dollars
11/12 Salaries and Benefits	90,000
21 Travel	70,000
25.5 Research Agreements	340,000

Mr. Skeen: According to the budget justifications, the global research initiative would be supported by competitive grants to facilitate globalization of U.S. agricultural colleges and universities. Please explain to the Committee what this means, and specifically, how this would support this initiative.

Response: The REE Mission Area agencies developed a multi-agency initiative to provide resources "to focus research and outreach programs on international issues of vital interest to the U.S. and which will contribute to alleviation of global food insecurity." This REE initiative is composed of two components: "(1) competitive grants to facilitate globalization of U.S. agricultural colleges and universities and to combat causes of food insecurity: and (2) research on issues of importance to the United States but requiring collaboration of a foreign institution." The first of these two components, the competitive grants program, is to be managed by CSREES and the funds for that initiative and the justification are included in the CSREES budget request. The second component, research and outreach, is to be managed by ERS and our budget request includes funds and justification for this component. The two components are complementary in that some of the research activities under the second component will be carried out in cooperation with universities and some of the longer-term exchange activities under the collaborative research program may involve a training component at a university. Likewise, some of the activities carried out under the competitive grants program could involve ERS and could contribute to collaborative research and outreach. A stronger global dimension to research and teaching programs in agricultural colleges and universities would improve the ability of the universities to partner with ERS in our closer collaboration with institutions in other countries to tackle critical issues of mutual interests.

Mr. Skeen: Is the ERS currently involved in any competitive grants program to combat causes of food insecurity? If so, please explain the program and the dollar amount of any competitive grant that may be focused on this issue.

Response: Through its annual competitive grant and cooperative agreement program, ERS' Food Assistance and Nutrition Research Program (FANRP) has funded a number of research studies to examine the causes and consequences of food insecurity and hunger. In fiscal year 1999, ERS competitively awarded four studies that focused on food security research for a total of $763,000. This included a study on hunger and its impact in poor female-headed households with children, analysis of survey data collected by the Census Bureau, a conference on community security research, and the development of a toolkit for community food security assessment. One of the thirteen priority research issues identified in this year's competitive grant and cooperative agreement program announcement is "Understanding the Causes and Consequences of Food Insecurity." This issue area invites research on such topics as the complex interactions between food insecurity and food assistance programs, the uneven temporal incidence of food insecurity, and the relationship of food insecurity to food expenditures and/or labor force activities. Studies examining linkages between community characteristics and food insecurity are also of interest. No funds have been spent for demonstration or implementation activities to combat food insecurity.

Mr. Skeen: Is the ERS currently in collaboration with foreign institutions on research issues of importance to the U.S.? If so, please explain the program and the amount of funds ERS is spending on it.

Response: ERS is currently collaborating with China and Mexico under the Emerging Markets Program (mandated by Congress and administered by FAS). The ERS China and Mexico projects were initiated in 1996 and funding totaled about $5 million between 1996 and 2000. ERS is just finishing a multi-year $1 million project with the Ukraine.

The main objectives of the projects are to 1) improve the quality and quantity of agricultural information and data from these countries; 2) to supply U.S. farmers with the statistics, forecasts, and analyses about agriculture in these countries to help them adjust and adapt to changes in the global food system; and 3) to provide U.S. agribusinesses with high quality information about these markets so they can effectively compete in them.

The projects help China and Mexico expand and refine their commodity economic information and forecasting systems and initiate publication of market analysis reports for individual commodities. Technical training focused on economic theory, quantitative methods, supply and use of specific commodities, market structure analysis and industry reports, and computerized database processing and dissemination systems.

Mr. Skeen: Did the ERS include the $500,000 increase for the global research initiative in its request to the Department.

Response: Yes, ERS included an increase for the global research initiative in its request to the Department.

Mr. Skeen: If the ERS is involved in any work related to the new mandatory price reporting law without reimbursement, what, if any, current services are being reduced to carry out that work?

Response: ERS is involved in preliminary planning for implementation of the retail price component of the new retail price reporting law. The planning activity for implementation has been done without reimbursement. The work to date (developing an implementation strategy) has not required a significant commitment of resources, but has reduced analysts' time available for ongoing market analysis and outlook activities related to livestock and meats.

NATIONAL AGRICULTURAL STATISTICAL SERVICE

TOLL-FREE NUMBER

Mr. Skeen: How many calls has the toll free number received since its inception for the Census of Agriculture?

Response: A total of 135,500 toll free telephone calls have been received to date since its inception on December 1, 1997.

CENSUS CYCLE COSTS

Mr. Skeen: Update the table that appears on page 867 of last year's hearing record showing the full cycle costs by line item for the Census to include actuals and any revised estimates.

Response: The table provided shows the updated full cycle costs for the 2002 Census of Agriculture.

2002 Census of Agriculture
Estimated Full Cycle Costs by Line Item

(In thousands of dollars)

CENSUS OF AGRICULTURE	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
	FY 2000 Estimate 1/	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	Est. 2002 Full-Cycle Costs
Direction	$4,160	$3,600	$3,935	$4,640	$4,870	$21,205
Content Determination and Design (includes printing)	1,090	3,900	4,250	1,825	1,500	12,565
Mail List Development and Mailout	2,280	2,150	4,300	8,925	2,750	20,405
Collection and Processing	4,610	4,650	7,940	23,125	7,580	47,905
Publication and Dissemination	2,450	700	1,125	3,125	6,250	13,650
Total Estimated Obligations	14,590	15,000	21,550	41,640	22,950	115,730

1/ FY 2000 total includes $9.6 million for the 1997 Census of Agriculture and $4.9 million for the 2002 Census of Agriculture activities. It does not include $1.9 million for the Agricultural Economics and Land Ownership Survey.

INTERNATIONAL TECHNICAL ASSISTANCE

Mr. Skeen: Please update the list of countries to which NASS is currently providing technical assistance along with a brief description of the technical assistance you are providing.

Response: NASS is continuing to provide technical assistance to improve agricultural statistics programs in Chile, China, Ecuador, Ghana, Guinea, Kazakhstan, Mexico, Nicaragua, Russia, South Africa, and Ukraine. This assistance is helping these countries improve statistical procedures and processes for agricultural data collection primarily through improved sample survey methodology and sound statistical methods of data collection and analysis for both surveys and censuses of agriculture.

Mr. Skeen: Please provide the total amount of reimbursement for fiscal year 1999, and estimates for fiscal years 2000 and 2001 for technical assistance to other countries.

Response: Technical assistance activities NASS provides to other countries is fully reimbursed. For fiscal year 1999, NASS received $659,800 for technical assistance. For fiscal years 2000 and 2001, it is projected to be approximately $900,000 each year.

NASDA ENUMERATORS

Mr. Skeen: Please update the table that appears on page 870 of last year's hearing record, showing the number of NASDA employees, the amount you reimbursed NASDA for these employees, and what percentage this reimbursement is of your total budget, to include fiscal year 1999 actuals and fiscal years 2000 and 2001 estimates.

Response: The following updated table shows the number of NASDA employees, NASDA agreement amounts, and the percent of NASS obligations, including estimates for fiscal years 2000 and 2001.

Year	Number of NASDA employees 1/	NASDA agreement amount ($000)	Percent of NASS obligations 2/
1988	3,597	12,900	18.9
1989	3,568	12,900	17.8
1990	3,975	14,300	18.7
1991	3,775	16,900	19.5
1992	3,784	18,000	19.4
1993	3,851	16,900	18.2
1994	3,500	15,500	17.0
1995	3,500	15,300	17.0
1996	3,267	15,700	17.3
1997	3,431	17,000	15.4
1998	3,565	22,315	17.5
1999	3,404	20,468	18.0
2000	3,500	18,500	16.8
2001	3,500	19,000	17.2

1/ The number of employees for which NASDA issued a W-2 including employees who worked at any time during the year. The peak number of employees working at any one time is during the first two weeks of June when approximately 2,100 enumerators are utilized nationwide.

2/ Obligations include NASS appropriations plus incoming reimbursements for services provided by NASS.

STATE OFFICE FUNDING

Mr. Skeen: Update the table that appears on page 871 of last year's hearing record, showing funding levels for NASS state offices by including fiscal year 1999 actuals and fiscal years 2000 and 2001 estimates.

Response: The following is a table showing the State and Federal contributions including estimates for fiscal years 2000 and 2001. It is important to note that the State cooperators' contributions over this period have nearly kept pace in proportion to the Federal contribution.

FUNDING OF NASS STATE OFFICES
(Dollars in millions)

	NASS State offices co-located in cooperator space			All NASS State offices in cooperator or Federal space		
Year	Federal	Cooperator	Total	Federal	Cooperator	Total
1988	19.2	6.1	25.3	37.9	9.7	47.6
1989	20.3	7.2	27.5	39.5	10.9	50.4
1990	20.8	7.9	28.7	41.4	12.1	53.5
1991	23.8	8.2	32.0	47.3	12.2	59.5
1992	28.6	8.2	36.8	50.3	12.3	62.6
1993	25.5	8.0	33.5	49.8	12.1	61.9
1994	23.2	7.7	30.9	46.3	12.2	58.5
1995	22.2	7.3	29.5	48.0	11.8	59.8
1996	21.3	7.6	28.9	47.8	12.4	60.2
1997	25.9	7.8	33.7	51.5	12.4	63.9
1998	28.9	8.0	36.9	58.3	13.0	71.3
1999	30.1	8.5	38.6	60.9	13.8	74.7
2000	29.7	8.2	37.9	60.6	13.4	74.0
2001	29.5	8.0	37.5	60.3	13.0	73.3

ONGOING SERVICES

Mr. Skeen: Did you eliminate any ongoing services during fiscal year 1999? If so, what ongoing services were eliminated?

Response: No ongoing services were eliminated during fiscal year 1999.

COOPERATIVE RESEARCH

Mr. Skeen: Please provide a list of all cooperative research agreements that were signed during fiscal year 1999, including a brief description of each agreement as well as its cost.

Response: NASS conducts an ongoing cooperative research program with several universities as a way of introducing new statistical techniques and methodologies into the NASS operational program. In fiscal year 1999, a new agreement was signed with Southern Illinois University for $25,000. The following is a list of all cooperative research projects funded by NASS for fiscal year 1999.

LIST OF FY 1999 COOPERATIVE RESEARCH AGREEMENTS

Cooperator	Amount	Purpose
George Mason University	25,000	Research aligning agricultural census results with estimates from NASS sample surveys
University of Houston	25,000	Research and analysis in the development and documentation of "list only" estimators
Ohio State University	25,000	Research and analysis in small area estimation
Purdue University	25,000	Precision farming yield research
University of Michigan	50,000	Research to improve survey interviewer effectiveness
American Statistical Association	70,000	Fellowship program for visiting researchers from academia or industry
University of Maryland	8,000	Research to measure and improve management effectiveness
Iowa State University	94,500	Research on multi-phase and other estimators useful for censuses and surveys
Southern Illinois University	25,000	Research to improve predictive models for soybean yields

COOPERATIVE AGREEMENTS

Mr. Skeen: Please provide a list of all cooperative agreements that were signed during fiscal year 1999, including the amount and purpose of each agreement. Also include in this list all those agreements planned for fiscal year 2000.

Response: The following is a list of NASS cooperative agreements and amendments executed during fiscal year 1999 as well as a list of those planned for fiscal year 2000.

FISCAL YEAR 1999 OUTGOING COOPERATIVE AGREEMENTS

COOPERATOR	AMOUNT	PURPOSE
National Association of State Departments of Agriculture	$20,500,000	Data Collection
Washington Department of Agriculture	40,000	Crop Reporting Services
Nebraska Department of Agriculture	30,000	Assistance in Dissemination of Crop and Livestock Reports
Alabama Department of Agriculture	7,000	Assistance in Dissemination of Crop and Livestock Reports
Idaho Department of Agriculture	25,000	Assistance in Dissemination of Crop and Livestock Reports
Louisiana Department of Agriculture and Forestry	55,000	Assistance in Dissemination of Crop and Livestock Reports
Oklahoma Department of Agriculture	21,000	Assistance in Dissemination of Crop and Livestock Reports
Texas Department of Agriculture	20,000	Assistance in Dissemination of Crop and Livestock Reports
Maryland Department of Agriculture	51,500	Assistance in Dissemination of Crop and Livestock Reports
Minnesota Department of Agriculture	15,000	Assistance in Dissemination of Crop and Livestock Reports
Illinois Department of Agriculture	32,500	Assistance in Dissemination of Crop and Livestock Reports
Kansas State Board of Agriculture	9,000	Assistance in Dissemination of Crop and Livestock Reports

FISCAL YEAR 1999 OUTGOING COOPERATIVE AGREEMENTS

COOPERATOR	AMOUNT	PURPOSE
Kentucky Department of Agriculture	5,000	Assistance in Dissemination of Crop and Livestock Reports
Tennessee Department of Agriculture	33,000	Crop Reporting Services
Georgia Department of Agriculture	42,000	Crop Reporting Services
West Virginia Department of Agriculture	10,500	Crop Reporting Services
Wisconsin Department of Agriculture	91,200	Crop Reporting Services
New York Department of Agriculture	5,000	Crop Reporting Services
Hawaii Department of Agriculture	3,300	Crop Reporting Services
North Carolina Department of Agriculture	79,000	Computer Services
North Carolina Department of Agriculture	95,000	Crop Reporting Services
North Carolina Department of Agriculture	46,000	Agricultural Statistics List Frame
Mississippi Department of Agriculture	99,500	Crop Reporting Services
Virginia Department of Agriculture	6,000	Assistance in Dissemination of Crop and Livestock Reports
University of Arkansas	49,600	Crop Reporting Services

FISCAL YEAR 1999 OUTGOING COOPERATIVE AGREEMENTS

COOPERATOR	AMOUNT	PURPOSE
University of Alaska	11,100	Crop Reporting Services
New Mexico State University	15,000	Indian Resource Development Program
New Jersey Department of Agriculture	60,000	Crop Reporting Services
North Dakota Agricultural Experiment Station	52,000	Assistance in Dissemination of Crop and Livestock Reports
Ohio Department of Agriculture	126,800	Assistance in Dissemination of Crop and Livestock Reports
Purdue University	11,500	Assistance in Dissemination of Crop and Livestock Reports
Iowa Department of Agriculture	17,500	Assistance in Dissemination of Crop and Livestock Reports
Puerto Rico Department of Agriculture	42,500	Census of Agriculture
University of Michigan	50,000	Interviewer Performance Improvement
University of Houston	25,000	List-Frame Design Estimates
Purdue University	75,000	Site-specific Data Utilization
Ohio State University Research Foundation	65,000	Small Area Estimates of Crop Yields
George Mason University	25,000	List-Only-Frame-Augmented Surveys
American Statistical Association	10,000	Improved Sampling of Survey Methodology
California Employee Development Department	71,000	Agricultural Labor Data

FISCAL YEAR 1999 OUTGOING COOPERATIVE AGREEMENTS

COOPERATOR	AMOUNT	PURPOSE
California Department of Pesticide Regulation	50,000	Agricultural Labor Data
University of Maryland	5,000	Organization Climate Survey
Southern Illinois University	20,000	Soybean Yield Research
American Samoa Department of Commerce	100,000	Census of Agriculture
Southern University	2,000	Cooperative Study Program
University of Minnesota	20,000	PigCHAMP Program
Iowa State University	18,000	Improved Statistical Model in Context of Sample Survey
Total:	22,243,500	

FISCAL YEAR 2000 OUTGOING COOPERATIVE AGREEMENTS PLANNED

COOPERATOR	AMOUNT	PURPOSE
National Association of State Departments of Agriculture	$18,500,000	Data Collection
Washington Department of Agriculture	40,000	Crop Reporting Services
Nebraska Department of Agriculture	15,000	Assistance in Dissemination of Crop and Livestock Reports
Alabama Department of Agriculture	2,000	Assistance in Dissemination of Crop and Livestock Reports
Idaho Department of Agriculture	57,000	Assistance in Dissemination of Crop and Livestock Reports
Louisiana Department of Agriculture and Forestry	55,000	Assistance in Dissemination of Crop and Livestock Reports
Oklahoma Department of Agriculture	24,000	Assistance in Dissemination of Crop and Livestock Reports
Texas Department of Agriculture	22,000	Assistance in Dissemination of Crop and Livestock Reports
Maryland Department of Agriculture	45,200	Assistance in Dissemination of Crop and Livestock Reports
Minnesota Department of Agriculture	18,000	Assistance in Dissemination of Crop and Livestock Reports
Illinois Department of Agriculture	52,000	Assistance in Dissemination of Crop and Livestock Reports

FISCAL YEAR 2000 OUTGOING COOPERATIVE AGREEMENTS PLANNED

COOPERATOR	AMOUNT	PURPOSE
Kansas State Board of Agriculture	12,000	Assistance in Dissemination of Crop and Livestock Reports
Kentucky Department of Agriculture	5,000	Assistance in Dissemination of Crop and Livestock Reports
Tennessee Department of Agriculture	33,900	Crop Reporting Services
Georgia Department of Agriculture	42,000	Crop Reporting Services
West Virginia Department of Agriculture	10,500	Crop Reporting Services
Wisconsin Department of Agriculture	94,400	Crop Reporting Services
New York Department of Agriculture	5,000	Crop Reporting Services
North Carolina Department of Agriculture	92,000	Support to Maintain List Frame & Printing
North Carolina Department of Agriculture	87,600	Crop Reporting Services
North Carolina Department of Agriculture	46,000	Agricultural Statistics List Frame
Mississippi Department of Agriculture	113,900	Crop Reporting Services
University of Arkansas	67,700	Crop Reporting Services
University of Alaska	11,890	Crop Reporting Services
New Jersey Department of Agriculture	60,000	Crop Reporting Services
North Dakota Agricultural Experiment Station	52,000	Assistance in Dissemination of Crop and Livestock Reports

FISCAL YEAR 2000 OUTGOING COOPERATIVE AGREEMENTS PLANNED

COOPERATOR	AMOUNT	PURPOSE
Ohio Department of Agriculture	123,300	Assistance in Dissemination of Crop and Livestock Reports
Purdue University	12,000	Assistance in Dissemination of Crop and Livestock Reports
Iowa Department of Agriculture	17,500	Assistance in Dissemination of Crop and Livestock Reports
University of Michigan	50,000	Interviewer Performance Improvement
University of Houston	75,000	List-Frame Design Estimates
George Mason University	50,000	List-Only-Frame-Augmented Surveys
American Statistical Association	82,567	Improved Sampling of survey Methodology
California Employee Development Department	76,000	Agricultural Labor Data
California Department of Pesticide Regulation	50,000	Agricultural Labor Data
Southern University	2,000	Cooperative Study Program
University of Minnesota	20,000	PigCHAMP Program
Syracuse University	69,290	Small Geographic Estimation
North Dakota State University	50,000	Electronic Media Development Training Video
Florida A&M University	25,000	Utilization of LANDsat Data for Crop Specific Information
Total:	20,266,747	

REIMBURSABLE SURVEYS

Mr. Skeen: Please update the table that appears on page 884 of last year's hearing record that shows a list of all surveys done on a reimbursable basis to include the amount of reimbursement.

Response: The following is a list of all the surveys done on a reimbursable basis in fiscal year 1999 including the amount of reimbursement.

National Agricultural Statistics Service
Reimbursable Surveys, FY 1999

Source	Project	Amount
Agricultural Marketing Service	Milk Price Data	$ 174,500
	Milkfat Data	42,000
	Pesticide Data Program	60,000
Agricultural Research Service	Assistance on Food Consumption Survey Data	15,000
Animal Plant Health Inspection Service	National Animal Health Monitoring System	380,000
	Livestock Wildlife Damage Control	120,000
Economic Research Service	Agriculture Structure Needs Survey	8,000
	Agricultural Resources Management Survey	3,943,610
Farm Service Agency	Feed Grain County Estimates	100,000
Forest Service	Grazing Fees	47,000
Natural Resources Conservation Service	Census of Agriculture Data Lab	50,000
Risk Management Agency	County Estimates	675,000
Department of Interior	BLM - Grazing Fees	43,500
	American Samoa - Agriculture Census	50,000
National Science Foundation	Data Collection	20,000
National Institute for Occupational Safety and Health	Childhood Agriculture Injury Study	750,000
State Departments of Agriculture	Crop Reporting Services	2,127,477

BUDGET REQUESTS

Mr. Skeen: Provide a detailed table of your budget request to the Secretary, the Secretary's request to OMB, and the OMB allowance.

Response: On an actual basis, a budget of $117,059,000 was submitted to the Secretary, who recommended a budget of $110,590,000 to OMB. These figures were based on the 2000 President's Budget. However, the OMB allowance was based on the actual FY 2000 Appropriation. On a comparable basis, the respective budget requests are $115,883,000 and $109,364,000. The OMB allowance was $100,615,000. The following table shows the detail of the requests.

Item	Agency Estimate	Department Estimate	Budget Request
	(Dollars in thousands- FY 2001)		
Census of Agriculture Cycle Change	+$410	+$410	+$410
Agricultural Economics and Land Ownership Survey	-1,900	-1,900	-1,900
Computer Security Architecture	+2,800	+2,800	+1,400
Monthly Hog Survey	+1,200	+1,200	+572
Mid-Atlantic Program	+2,400	+1,900	--
Expanded Pesticide Use Surveys	+2,500	+2,000	+800
Coverage of American Indians and Other Farm Operators	+1,000	+1,000	--
Crop Specific Categorination of LANDSAT Data	+1,200	--	--
Global Agricultural Costs	+3,500	--	--
Increased Operating Costs	+769	--	--
Annualization of FY 2000 Pay Costs	+694	+694	--
FY 2000 Pay Costs	+1,927	+1,927	--
All Other	99,333	99,333	99,333
Total(comparable basis)	115,833	109,364	100,615
Comparability Adjust.	+1,226	+1,226	--
Total (actual basis)	117,059	110,590	100,615

NUMBER OF FARMS, LAND IN FARMS

Mr. Skeen: Please update the table that appears on page 887 of last year's hearing record, showing the number of farms operating in the U.S., the acreage of land being farmed, and the total U.S. acreage to include fiscal year 1999 actuals.

Response: The table below shows the updated number of farms operating in the U.S., the acreage of land being farmed, and the total U.S. acreage including 1999 for the former two.

Year	Number of Farms 1/ thousand	Land in Farms 1/ million acres	Total Land Area 2/ million acres
1985	2,293	1,012	
1986	2,250	1,005	
1987	2,213	999	
1988	2,201	994	
1989	2,175	991	
1990	2,146	987	2,263
1991	2,117	982	
1992	2,108	979	
1993	2,202	969	
1994	2,198	966	
1995	2,196	963	
1996	2,191	959	
1997	2,191	956	
1998	2,191	954	
1999	2,194	947	

1/ Source: USDA, Farms and Land in Farms.
2/ Source: U.S. Bureau of the Census.

A farm is defined as "any establishment from which $1,000 or more of agricultural products were sold or would normally be sold during the year." Government payments are included in sales. Institutional farms, experimental and research farms, and Indian Reservations are included as farms. To be considered a farm, the place must be operating sometime during the year. Prior to 1993

the estimates were for farms operating on June 1. Places with all their acreage enrolled in the Conservation Reserve or other government programs are considered operating.

The farm definition used for the census of agriculture and the definition used for NASS's annual estimate of number of farms are now the same. Between 1995 and 1997, there were substantial changes made to the farm definition so that the census of agriculture number and the NASS official series would have the same definition. For example, NASS added as farms those places with five or more horses and no other agricultural sales. The 1997 Census of Agriculture included as farms Christmas tree operations and places with all acreage enrolled in government programs. Two new industries, maple syrup and short rotation woody crop farms, were added to both counts as a result of the implementation of the new North American Industry Classification System. All changes made to the farm definition since 1995 were carried back to 1993 and included in the 1993-99 estimates. These modifications resulted in a level change in farm numbers between 1992 and 1993.

MIGRANT WORKERS

Mr. Skeen: Please update the table that appears on page 889 of last year's hearing record on the number of migrant workers to include 2000.

Response: The following table shows the updated number of migrant workers including available 2000 data.

Migrant Workers: Percent of all Hired Workers, United States, By Quarter (Includes Agricultural Service Workers), 1997-2000 [1/]

Year	January	April	July	October
	Percent	Percent	Percent	Percent
1997	9.5	6.3	10.8	11.2
1998	7.3	6.6	13.7	11.0
1999	6.0	8.7	12.4	12.3
2000	7.3			

1/ Definition: "Migrant Worker" is a farm worker whose employment required travel that prevented the farm worker from returning to his/her permanent place of residence the same day.

MILK PRODUCTION

Mr. Skeen: Please provide a five-year table similar to the one that appears on page 890 of last year's hearing record that shows a summary of milk production estimates by state to include fiscal year 1999.

Response: The table below shows the updated summary of milk production estimates by state to include fiscal year 1999.

Annual Milk Production

State	1994	1995	1996	1997	1998	1999
			Million Pounds			
AL	500	482	434	418	386	374
AK	12.60	11.90	13.50	15.00	14.33	13.58
AZ	2,134	2,230	2,474	2,664	2,680	2,931
AR	753	729	675	635	540	520
CA	25,234	25,327	25,848	27,582	27,654	30,475
CO	1,553	1,551	1,633	1,679	1,689	1,728
CT	530	526	499	509	529	520
DE	143	145	140	148	163	171
FL	2,623	2,381	2,401	2,476	2,337	2,398
GA	1,595	1,555	1,486	1,488	1,437	1,449
HI	139.0	142.0	129.0	123.0	129.0	119.7
ID	3,754	4,210	4,735	5,193	5,765	6,453
IL	2,452	2,399	2,247	2,203	2,121	2,029
IN	2,257	2,214	2,166	2,189	2,190	2,185
IA	3,960	4,047	3,784	3,693	3,811	3,802
KS	1,125	1,180	1,200	1,285	1,315	1,395
KY	2,007	2,020	1,860	1,815	1,710	1,645
LA	925	905	838	794	751	711
ME	639	641	648	662	680	693
MD	1,335	1,340	1,312	1,326	1,340	1,365
MA	455	448	440	434	438	420
MI	5,545	5,565	5,430	5,410	5,365	5,455
MN	9,342	9,409	9,440	9,210	9,275	9,478
MS	731	710	658	634	579	552
MO	2,715	2,690	2,443	2,362	2,367	2,220
MT	307	315	307	295	291	303
NE	1,110	1,095	1,050	1,040	1,050	1,139
NV	413	426	470	477	502	497
NH	313	326	324	328	333	321
NJ	330	320	297	299	292	280
NM	3,325	3,623	3,753	4,011	4,354	4,725
NY	11,400	11,600	11,510	11,530	11,750	12,040
NC	1,473	1,403	1,308	1,304	1,251	1,216
ND	869	838	804	713	706	689
OH	4,513	4,600	4,360	4,415	4,410	4,445
OK	1,287	1,293	1,245	1,249	1,236	1,249
OR	1,714	1,677	1,608	1,610	1,583	1,665
PA	10,230	10,489	10,484	10,662	10,847	10,931
RI	31.6	32.5	31.2	31.9	33.0	31.0
SC	411	391	381	397	374	369
SD	1,589	1,581	1,474	1,384	1,435	1,507
TN	1,812	1,745	1,630	1,609	1,501	1,417
TX	6,225	6,113	6,120	5,768	5,605	5,620
UT	1,431	1,473	1,547	1,540	1,513	1,613
VT	2,457	2,545	2,569	2,600	2,650	2,712
VA	1,924	1,950	1,805	1,858	1,841	1,879
WA	5,203	5,304	5,279	5,305	5,326	5,535
WV	272	266	252	266	278	275
WI	22,412	22,942	22,376	22,368	22,842	23,071
WY	91.3	87.1	88.4	83.8	79.8	79.8
US	153,602	155,292	154,006	156,091	157,348	162,711

MANN LIBRARY

Mr. Skeen: What is the cost of the cooperative agreement with the Mann Library of Cornell University for fiscal year 2000?

Response: For fiscal year 2000, the cost for the Mann Library is expected to be $18,000.

REPORTS ON-LINE

Mr. Skeen: Please provide a list of all reports NASS has available on-line.

Response: All NASS reports are available on-line at www.usda.gov/nass/. A listing of the report titles are shown below. The number of reports issued annually are shown in parenthesis for titles with multiple issues.

Agricultural Land Values
Agricultural Cash Rents
Agricultural Chemical Usage (3 issues)
Agricultural Prices (13 issues)
Agricultural Statistics Book
Broiler Hatchery (54 issues)
Catfish Processing (16 issues)
Catfish Production (4 issues)
Cattle (2 issues)
Cattle on Feed (12 issues)
Cherry Production
Chickens and Eggs (15 issues)
Citrus Fruits
Cold Storage (14 issues)
Cotton Ginnings (14 issues)
Cranberries
Crop Production (17 issues)
Crop Progress (36 issues)
Crop Values
Dairy Products (13 issues)
Dairy Products Prices (52 issues)
Egg Products (12 issues)
Farm Labor (4 issues)
Farms & Land in Farm
Farm Computer Ownership and Usage
Farm Production Expenditures
Floriculture Crops
Grain Stocks (4 issues)
Hogs and Pigs (4 issues)

Honey
Hop Stocks (2 issues)
Livestock Chemical Use
Livestock Slaughter (13 issues)
Meat Animals: Production Disposition and Income
Milk Production (13 issues)
Mink
Mushrooms
Noncitrus Fruit and Nuts (2 issues)
Peanut Stocks & Processing (12 issues)
Pest Management Practices
Post Harvest Applications: Apples and Potatoes
Post Harvest Applications: Corn and Wheat
Post Harvest Applications: Soybeans and Oats
Potatoes (7 issues)
Poultry Production and Value
Poultry Slaughter (12 issues)
Rice Stocks (4 issues)
Sheep and Goats (3 issues)
Trout Production
Turkey Hatchery (16 issues)
Vegetables (6 issues)

SPECIAL SURVEYS

Mr. Skeen: Provide a list of all special surveys NASS conducted in fiscal year 1999 including the total cost of each survey.

Response: Following is a list of 107 special surveys and projects conducted in fiscal year 1999.

NASS FISCAL YEAR 1999 SPECIAL SURVEYS

STATE	NO OF SPECIAL SURVEYS	SURVEY	TOTAL COST
AL	1	Forage Crop Pesticide Survey	$ 7,500
AZ	2	Pesticide Use Data Survey	5,000
AZ		Nursery Survey	8,565
CA	6	Walnut/Raisin/Prune Surveys	20,000
CA		Grape Crush Survey	105,000
CA		Objective Measurement Survey	225,000
CA		Grape Acreage Survey	110,000
CA		Objective Measurement Survey	96,000
CA		Almond Obj Measurement Survey	100,000
CO	3	Equine Industry Survey	30,000
CO		Wheat Varieties Survey	4,200
CO		County Estimates Survey	4,725
DE	5	Farm Disabilities Survey	2,200
DE		Melon Pest Use/Crop Practices	3,500
DE		Ag Land Preservation Survey	5,000
DE		Ag Land Values Survey	11,000
DE		Vegetable Production Survey	11,000
FL	1	County Estimates Survey	4,800
GA	1	Cotton Management Study Survey	2,500
ID	1	Wheat Variety Survey	2,500
IL	3	Corn and Soybeans Survey	1,137
IL		Mine Reclamation Yield Project	36,000
IL		Ground Truth Data Collection	9,500
IN	7	Fruit and Nut Chem Usage Survey	10,000
IN		ARMS Survey	22,650
IN		Popcorn Processor Surveys	300
IN		Cyst Nematode Analysis Survey	1,400
IN		Myotoxin Analysis Survey	525
IN		Timber Price Survey	4,400
IN		Broiler Grower Survey	2,700
IA	2	GMO Crops Raised in IA Survey	20,000

IA		IA In The Future Survey	15,000
KS	10	Wheat Varieties Survey	7,600
KS		Custom Rates Survey	6,500
KS		Bluestem Pasture Survey	2,900
KS		Wheat Quality Survey	4,000
KS		Wheat/Sorghum Pest Use Survey	24,850
KS		Wheat Tissue Sample Collection	2,500
KS		Land Values and Rents Survey	6,500
KS		Landlord Expense Survey	4,250
KS		Soybean Variety Survey	12,550
KS		Grain Transportation Survey	7,760
KY	1	Health and Injury Survey	20,230
MD	4	Management Practices Survey	14,000
MD		Aquaculture Survey	1,500
MD		Cropland Rental Rate Survey	1,500
MD		Pesticide Use Survey	15,000
MI	10	Tart Cherry Measurement Survey	18,000
MI		Vegetable Chem Use Survey	10,000
MI		Conditions of Dairy Econs Survey	3,000
MI		Antibiotic Resistance Survey	500
MI		Delivery of Ext Service Survey	3,000
MI		Tart Cherry Obj Yield Survey	30,000
MI		Rotational Nursery Survey	37,500
MI		Rotational Vegetable Survey	15,500
MI		Various State Surveys	2,000
MI		Nut Chemical Use Survey	5,200
MN	1	Farm Injury Survey	145,104
MS	4	Various Surveys	66,000
MT	1	Cnty Ests for Minor Crops Survey	5,000
NH	1	Fresh Fruit Survey	1,200
NJ	1	Orchard and Vineyard Survey	5,000
NM	1	Chile Survey	10,000
NY	6	County Estimates Survey	10,000
NY		Muck Mapping Survey	3,300
NY		Onion Objective Yield Survey	11,000
NY		Apple Cold Storage Survey	1,000
NY		Various State Surveys	7,950
NY		Integrated Pest Management Survey	3,000
NC	3	Farm Information Survey	8,900
NC		Strawberry Survey	10,000
NC		Turfgrass Survey	25,000
ND	4	County Estimates Survey	10,500
ND		Soybean Variety Survey	3,000
ND		Land Rents Survey	5,500
ND		Wheat and Barley Quality Survey	38,262
OH	3	Hog Producer Contracting Attitudes	1,400
OH		Land Rental Rates Survey	1,488

OH		Custom Rates Survey	1,488
SD	2	Land Rent and Values Survey	9,000
SD		Wheat Variety Survey	6,000
TX	6	Fire Ant Survey	15,000
TX		Custom Rates Survey	9,000
TX		Ag Labor Survey	12,000
TX		Rick Management Study Survey	8,700
TX		District and County Estimates	283,266
TX		Ag Labor Survey	14,500
UT	2	County Estimates	6,000
UT		Sheep Loss Survey	5,000
VA	1	Turfgrass Survey	30,550
WA	1	Wheat Variety Survey	5,200
WA	1	Hops Survey	3,100
WI	6	Integrated Pest Mgt Survey	15,000
WI		Farm Children Safety Survey	15,000
WI		Farm Opinion Poll Survey	5,000
WI		Grain Flow Survey	500
WI		Future Fields Survey	2,500
WI		Chem Use on Potatoes Survey	18,000
WY	6	Various Surveys	25,000
TOTALS	107		$2,000,850

PESTICIDE DATA COLLECTION

Mr. Skeen: How much did NASS spend on pesticide data collection in fiscal year 1999? How much does NASS plan to spend in fiscal years 2000 and 2001?

Response: For all pesticide use related survey efforts, NASS spent $5.7 million in 1999. This amount covers not only data collection costs, but also direct costs and overhead. Budgeted dollars are $6.5 million in 2000 which includes an increase of $800,000 for a nursery and greenhouse survey and $7.3 million proposed for fiscal year 2001 including an increase of $800,000 for additional field crop chemical use data collection.

CENSUS RESPONSE RATE

Mr. Skeen: The final response rate for the 1997 Census of Agriculture was 86.4 percent. Does NASS consider this rate acceptable, or is the agency taking steps to increase the response rate for the next census? If so, what steps is the agency taking to increase the response rate?

Response: NASS is taking steps to improve the response rate for the next census of agriculture. Unlike the 1997 census, NASS will have a full census cycle to prepare. By maintaining an on-going mail list for survey and census programs over the entire cycle instead of undertaking a major list build every 5 years, NASS will have a more accurate list at the start of the census. The improved quality of the list frame will reduce the overall size of the list and contribute to a higher response rate. In addition, NASS will continue to strive to emphasize the value of reliable agricultural statistics and encourage farmers and ranchers to participate in the census which provides a comprehensive snapshot of the Nation's agricultural sector every 5 years.

DELAWARE RIVER BASIN PILOT PROJECT

Mr. Skeen: Please bring the Committee up to date on the Delaware River Basin Pilot project.

Response: In 1996-97 the Committee on Environmental and Natural Resources (CENR) of the National Science and Technology Council (NSTC) developed a national Framework for Environmental Monitoring and Related Research (FEMR). The purpose of this framework is to use collaboration among existing monitoring programs to improve the capability of detecting, understanding,

and tracking environmental issues, and to provide resource managers with better science for setting and carrying out environmental policy. The original document describing the framework was written by a team representing 13 Federal science agencies, under the auspices of the CENR. Completion of the first draft of that document was followed by two stakeholder review workshops. Three recommendations came from these workshops: a) the development of a National Report Card on the health of the Nation's environment, to be published in 2001; b) a pilot of the Framework concept in the Mid-Atlantic Region; and c) an analysis of the concept of national integrated science, or "index" areas using existing data. The FEMR document and reports on the outcome of each workshop are available on the web at: http://www.epa.gov/cludygxb/.

Pilot activity in the Mid-Atlantic Region has focused on the Delaware River Basin. A draft implementation plan for the pilot was issued by an Interagency Implementation Planning Team in June 1999: *The Effects of Human Activity on Terrestrial and Aquatic Habitats in the Delaware River Basin: A Test of the Framework for Environmental Monitoring and Related Research.* Until recently, implementation activities were on hold due to a general lack of resources by the participating agencies. In March 2000, the Agricultural Research Service, Forest Service and the U.S. Geological Survey convened a meeting of interested agencies and State universities to begin a planning process for determining potential participants in the Delaware River Basin Pilot, identify possible agricultural sites for frequent monitoring and in-depth research, and to propose possible writing teams for interagency grant proposals. NASS attended the March meeting and will continue to participate in the future.

COUNTY DATA

Mr. Skeen: Last year NASS reported that commodity data are currently available via the Internet going back to 1866. Is the county data now available via the Internet?

Response: County data are available on the Internet at www.usda.gov/nass/ for all commodities in the Federal County Estimates program dating back to at least 1972. Commodities in the Federal program include major grains, oilseeds, cotton, dry edible beans, sugar crops, and tobacco. The NASS State Statistical Offices have keyed additional county data from historic publications prior to 1972. Some State data series begin around 1910.

PUERTO RICO OFFICE

Mr. Skeen: The fiscal year 2000 appropriations act provided $250,000 for a new office in Puerto Rico. Please bring the Committee up to date on the opening of this office.

Response: A Memorandum of Understanding between the Puerto Rico Department of Agriculture (PRDA) and the National Agricultural Statistics Service has been signed for the establishment of a cooperative statistical office. Site visits in November 1999 and March 2000 resulted in a list of project priorities and also provided an assessment of equipment needs that will foster compatibility between systems. By July 2000, NASS expects to have the new office in Puerto Rico open and staffed with two employees experienced in NASS methodology and technology working side-by-side with PRDA staff. NASS also plans to hire a student intern from the University of Puerto Rico to work in the office this summer.

Mr. Skeen: The original request for this office was $304,000. What items were reduced from the original request? Are office rental/lease costs involved? How much?

Response: The number of NASS staff positions in PRDA was reduced from three to two because of the reduction from the original request, and there was also a slight reduction in the amount budgeted for equipment and supplies. The NASS office will be collocated with PRDA, with the space to be provided by PRDA as part of the Memorandum of Understanding.

ERS REIMBURSEMENT

Mr. Skeen: The available funds and staff years table indicates a $4.2 million reimbursement for ERS for an agricultural resource management and agricultural structure studies. Please provide the Committee with a summary of this on-going work NASS is doing for ERS, and break it out between agricultural resource management and agricultural structure studies.

Response: The Agricultural Resource Management Study (ARMS) collects basic economic data on income, expenses, and debt annually. An integral part of the ARMS economic questionnaire is the collection of data on farmers' use of particular marketing channels and organizational structures and data on management decisions and operator demographics. In 1999, ERS funded a special Agricultural Structure Needs Survey to assess how changes

in the agriculture economy in the last decade have affected the need for agricultural information. NASS was paid $8,000 to collect data from oilseed, grain, cotton, sugarbeet, and hog producers.

AID REIMBURSEMENT

Mr. Skeen: The available funds and staff years table indicates a $900,000 reimbursement from AID for training, technical assistance, equipment, and personnel details. Please provide the Committee with a summary of this on-going work NASS is doing for AID into the four categories of work mentioned above. What additional work is NASS doing for fiscal year 2000 to increase the reimbursement by about $250,000?

Response: The $900,000 reimbursement is the total NASS expects to receive from all sources for training, technical assistance to other countries, equipment purchases, and personnel details. Of this $900,000 only $390,000 is AID funds for fiscal year 2000. The remaining $510,000 comes from Emerging Markets Funding in the Foreign Agricultural Service (FAS) and from World Bank or FAS funding. The additional work NASS is doing in fiscal year 2000 to cover the $250,000 increase is to expand assistance efforts in Ecuador and South Africa.

The table below shows the expected breakdown of FY 2000 funds into the specified categories:

Activity	AID	Emerging Markets	World Bank	FAS
Training	7,000	35,000	—	20,000
Technical Assistance	270,000	255,000	200,000	—
Equipment	50,000	—	—	—
Personnel Details	63,000	—	—	—
Total FY 2000	390,000	290,000	200,000	20,000

PRICE REPORTING LAW

Mr. Skeen: The fiscal year 2000 consolidated appropriations act contained $4.7 million to implement the new price reporting law. Did the NASS propose to the Department and/or to OMB the use of any of those funds? If so, what was proposed and when did

NASS propose it? Please provide a copy of the proposal for the record.

Response: NASS informally requested $400,000 to fund start-up activities for implementation of a monthly hog and pig report in FY 2000, but did not submit a formal request. Appropriated funds amounting to $4.7 million were employed by the Agricultural Marketing Service (AMS) to implement the new price reporting law. Those funds were not available to NASS for implementing Subtitle C - Related Swine Reporting Provisions, Section 931, Improvement of Hogs and Pigs Inventory Report.

Mr. Skeen: Is the NASS conducting any work related to the new price reporting law? What is the cost of that work and is any of it being reimbursed by any other USDA agency?

Response: NASS is preparing to implement the monthly *Hogs and Pigs* report as mandated by the new price reporting law contingent upon approval of the associated FY 2001 budget initiative. A monthly survey of hog breeding operations will be ready to begin October 1, 2000, to collect more timely information on market supplies of pigs. Publication of monthly data would begin December 1, 2000.

The full cost associated with providing monthly reports on the market supply of pigs and comparable basis with the current quarterly reports is $1.272 million. Full funding would provide data on pig supplies by location for 17 individual leading hog States as well as overall totals for the United States. No reimbursement will be made by any other USDA agency.

Mr. Skeen: If the NASS is involved in any work related to the new mandatory price reporting law without reimbursement, what, if any, current services are being reduced to carry out that work?

Response: New funding in FY 2001 is requested in the amount of $572,000 for this $1.272 million initiative. Funding at the $572,000 level would require NASS to scale back the monthly and quarterly *Hogs and Pigs* reports to include individual State data for 9 States, accounting for approximately 77 percent of breeding herd inventory, rather than providing data for 17 States, accounting for about 93 percent of breeding herds. U.S. totals will be available in either case but valuable location data will necessarily be reduced depending upon the new funding level.

FY 2001 PAY COSTS

Mr. Skeen: How much is included in the NASS budget for 2001 pay cost increases?

Response: The FY 2001 budget has $1,895,000 for pay costs, excluding the annualization of the 2000 pay costs. NASS does not have any increases for pay costs in its FY 2001 budget, so pay costs will be absorbed in other object classes.

COMPUTER SECURITY

Mr. Skeen: The budget proposes an increase of $1.4 million for computer security infrastructure. The justification gives a lot of detail describing the scope of the problem, but what would NASS do with the money if this request is approved?

Response: NASS would replace hubs with intelligent switches in our State offices. Firewalls and encryption capabilities will be added to all State offices, and our Washington, D.C., headquarters office. The benefits of each are as follows: (1) intelligent switches allow true network segmentation which provides a mechanism that masks the true identity of information technology components inside the NASS system, thereby protecting it from intrusion; (2) firewalls restrict access to or from a restricted site or individual; and (3) encryption protects communication circuits by transforming information to render it unintelligible to all but authorized individuals. NASS would also work with USDA's National Information Technology Center (NITC) in Kansas City, Missouri, to install encryption capabilities. This will provide a consistent solution throughout the NASS environment, and it will protect our UNIX equipment, which is under a facilities management contract, along with the NITC mainframe environment where our survey processing takes place. NASS will also be acquiring software and hardware to perform intrusion detection at all locations.

Mr. Skeen: Provide an object class table for the $1.4 million increase for computer security infrastructure.

Response: The table below provides the object class and the amount needed for computer security infrastructure.

OBJECT CLASS	AMOUNT
1100 Salaries	$ 134,000
1200 Benefits	$ 39,000
2500 Other Services	$ 277,000
2600 Supplies	$ 200,000
3100 Equipment	$ 750,000
TOTAL	$1,400,000

Mr. Skeen: Is NASS spending any funds on computer security infrastructure in fiscal year 2000? If so, how much and for what purpose?

Response: Yes, about $40,000 for maintenance of firewalls and switches currently installed in headquarters and at NITC. In addition, current security staff salaries and benefits total approximately $160,000.

Mr. Skeen: Please tell the Committee how NASS has coordinated this computer security infrastructure request with the Chief Information Officer.

Response: The NASS Director of the Information Technology Division (CIO) sits on the Departmental Information Technology (IT) Leadership Council and participates in the Department's CIO weekly staff meetings. Additionally, there is a security sub-council at the Departmental level that NASS security staff participate in. This computer security initiative passed through the Department's OCIO's Program, Planning, and Management Division in accordance with the normal Departmental review process.

This request is coordinated with and complements the Department's FY 2001 security request and is not in competition with it. NASS will be implementing a security architecture at the field office level that is compatible with the implementation of the Department's backbone telecommunications network. This allows NASS to share telecommunications resources at field offices that are collocated with other USDA Agencies. This implementation provides NASS with a virtual private network which allows the Agency to participate in optimization activities at the Department level while maintaining the confidentiality of data.

Mr. Skeen: How much of the increase would go towards software/hardware procurement?

Response: Hardware and software procurements will total $950,000. The acquisition of hardware will account for $750,000, and the software acquisitions will account for $200,000.

MONTHLY HOG SURVEY

Mr. Skeen: If the $572,000 net increase is approved for the monthly hog survey, what would be the total funding level for the hog survey program at NASS?

Response: The total cost of the hog survey program, if the requested $572,000 is approved, would be $4,000,000.

Mr. Skeen: Provide an object class table for the $572,000 increase requested for the hog survey program.

Response: The following table shows the object class breakout for the requested increase for the hog survey program.

OC 11 Personnel Compensation	$224,000
OC 12 Personnel Benefits	56,000
OC 21 Travel	9,000
OC 22 Transportation of things	4,000
OC 23 Rent, communications and utilities	21,000
OC 24 Printing and reproduction	2,000
OC 25 Other services	235,000
OC 26 Supplies and materials	7,000
OC 31 Equipment	14,000
Total	572,000

CONGRESSIONAL DISTRICT PUBLICATIONS

Mr. Skeen: Has NASS released the Congressional District Rankings and the Congressional District Tabulations for Specialty Products? If so, please provide them for the record.

Response: Yes, the Ranking of Congressional Districts Report was released in September 1999. A copy has been provided for the record.

[Clerk's note: The attachments were deemed too lengthy for printing and have been retained in Committee files.]

PESTICIDE USE STATISTICS

Mr. Skeen: Provide an object class table for the $800,000 increase for expansion of the pesticide use statistics program.

Response: The following table shows the object class breakout for the requested increase for the expansion of the pesticide use statistics program.

OC 11	Personnel Compensation	$223,000
OC 12	Personnel Compensation	54,000
OC 21	Travel	21,000
OC 22	Transportation of things	9,000
OC 23	Rent, communications and utilities	53,000
OC 24	Printing and reproduction	5,000
OC 25	Other services	387,000
OC 26	Supplies and materials	16,000
OC 31	Equipment	32,000
	Total	800,000

Mr. Skeen: How many and which states are covered in the program now? How many and which additional states would be covered by this increase?

Response: The table below outlines the number of States in the pesticide use statistics program by commodity area being studied, as of March 2000.

Commodity Area	States
Field Crops (31 States)	Alabama, Arizona, Arkansas, California, Colorado, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Washington, Wisconsin
Fruits and Nuts (14 States)	Arizona, California, Florida, Georgia, Indiana, Michigan, New Jersey, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Texas, Washington
Vegetables (19 States)	Alabama, Arizona, Arkansas, California, Florida, Georgia, Illinois, Michigan, Minnesota, New Jersey, New York, North Carolina, Ohio, Oregon, South Carolina, Tennessee, Texas, Washington, Wisconsin

Based on proposed funding increases and crop coverage for 2001, there would potentially be four additional States (Maryland, Utah, Virginia, and Wyoming) included in 2001 field crop chemical use surveys. This increases the total number of States from 31 to 35 that have some field crop commodity coverage for pesticide use in 2001.

Mr. Skeen: How many and which commodities are covered in the program now? How many and which additional commodities would be covered by this increase?

Response: The table below outlines the number of commodities in the pesticide use statistics program by the commodity area being studied, as of March 2000.

Commodity Area	Commodities
Field Crops (9 Commodities)	Corn, Upland Cotton, Rice, Soybeans, Sugar Beets, Winter Wheat, Durum Wheat, Spring Wheat, Potatoes
Fruits and Nuts (30 Commodities)	Almonds, Apples, Apricots, Avocados, Blackberries, Blueberries, Sweet Cherries, Tart Cherries, Dates, Figs, Grapefruit, All Grapes, Hazelnuts, Kiwi fruit, Lemons, Limes, Nectarines, Olives, Oranges, Peaches, Pears, Pecans, Pistachios, Plums, Prunes, Raspberries, Tangelos, Tangerines, Temples, Walnuts
Vegetables (42 Commodities) *FM=fresh market *PR=processing	Artichokes, Asparagus, Lima Beans (FM), Lima Beans (PR), Snap Beans (FM), Snap Beans (PR), Beets, Broccoli, Brussel Sprouts, Cabbage (FM), Cabbage (PR), Cantaloupe, Carrots (FM), Carrots (PR), Cauliflower, Celery, Collards, Sweet Corn (FM), Sweet Corn (PR), Cucumbers (FM), Cucumbers (PR), Eggplant, Garlic, Mustard Greens, Turnip Greens, Honeydews, Kale, Head Lettuce, Other Lettuce, Okra, Dry Onions, Green Peas (PR), Bell Peppers, Pumpkins, Radishes, Spinach (FM), Spinach (PR), Squash, Strawberries, Tomatoes (FM), Tomatoes (PR), Watermelons

Based on proposed funding increases and crop coverage for 2001, there would 13 additional field crops included in 2001 surveys (barley, dry beans, canola, flaxseed, hay, hops, lentils, mint, oats, rye, dry peas, sorghum, and sweet potatoes). This would bring the total number of field crops to 22.

Mr. Skeen: Please provide any documentation you may have that indicates a desire by EPA, USDA, and/or industry officials to expand this program.

Response: NASS participates in frequent meetings with other USDA agencies, EPA, and industry officials. In late 1999, NASS formally solicited feedback from these data users to use in a comprehensive review of the NASS chemical use program. Information from the completed questionnaires is being summarized and will be published in a document which will be submitted to the Committee by April 2000.

Mr. Skeen: Can you tell the Committee how EPA uses the data that NASS provides through the pesticide data survey program?

Response: EPA uses the NASS data for risk assessment and risk management for individual chemical products and cumulative exposure calculations of currently registered chemicals as the default when no data are available. The NASS chemical use data are populated into EPA's database supported by their Biological and Economic Analysis Division. EPA uses the State and national level actual survey chemical use data, rather than worst case scenarios as the default when no data are available, in the quantitative usage analysis for a chemical product's risk assessment. Variables included in this analysis are crop acres grown, acres treated, percent of crop treated, active ingredient applied, and average application rate. EPA computes weighted average estimates for the above variables from NASS and other available data sources.

Mr. Skeen: The budget justification states that funds would be used to expand the chemical use program to help address existing data gaps. Please explain what this means. What data gaps are out there?

Response: The chemical use program collects data for major commodities and major producing states. Available resources are prioritized to include major field crops, fruits and nuts, vegetables, and now major nursery and greenhouse commodities in major producing states. Major States typically account for 80 percent or more of the commodities of interest production. The data gaps are agricultural commodities and States not surveyed for chemical use statistics.

Current data gaps include lack of chemical use data by commodity in smaller producing states. For example, corn chemical use data are not collected for the New England States. Chemical data are

not collected for many of the IR-4 Program speciality commodities or tropical fruits. Chemicals applied to some livestock species and their facilities like poultry and poultry facilities are not available.

CENSUS OF AQUACULTURE

Mr. Skeen: Has NASS released the Census of Aquaculture? If so, please submit a copy for the record and please summarize your survey results for the Committee.

Response: Yes, the first Census of Aquaculture was released in February 2000. This special census provided a detailed picture of the aquaculture industry and revealed that Mississippi accounted for 30 percent of the $978 million dollars of domestic aquaculture produced in 1998; Arkansas, Florida, Maine, and Alabama ranked second through fifth in sales; food fish (e.g., catfish, trout, salmon, tilapia, hybrid striped bass, etc.) accounted for about two-thirds of the aquaculture sales and just under half of the farms producing aquaculture; the value of aquaculture products sold jumped over twenty percent from 1997 to 1998-$807 million to $978 million dollars; and food fish growers showed average sales of $387 thousand dollars per farm in 1998.

For the record, we have provided a copy of the 1998 Census of Aquaculture.

[Clerk's note: The attachments were deemed too lengthy for printing and have been retained in Committee files.]

[The justifications of the budget estimates follow:]

2001 Congressional Explanatory Notes

AGRICULTURAL RESEARCH SERVICE

Purpose Statement

The Agricultural Research Service (ARS) was established on November 2, 1953, pursuant to authority vested in the Secretary of Agriculture by 5 U.S.C. 301 and Reorganization Plan No. 2 of 1953, and other authorities.

The research performed by ARS is authorized by the Department of Agriculture Organic Act of 1862 (7 U.S.C. 2201, 2204), the Research and Marketing Act of 1946, amended (7 U.S.C. 427, 1621), the Food and Agriculture Act of 1977, as amended (7 U.S.C. 1281 note), the Food Security Act of 1985 (7 U.S.C. 3101 note), and the Food, Agriculture, Conservation, and Trade Act of 1990 (7 U.S.C. 1421 note), Federal Agriculture Improvement and Reform Act of 1996 (Fair Act) and the Agricultural Research, Extension, and Education Reform Act of 1998 (P.L. 105-185).

The mission of ARS research is to develop new knowledge and technology which will ensure an abundance of high quality agricultural commodities and products at reasonable prices to meet the increasing needs of an expanding economy and to provide for the continued improvement in the standard of living of all Americans. This mission focuses on the development of technical information and technical products which bear directly on the need to: (1) manage and use the Nation's soil, water, air and climatic resources, and improve the Nation's environment; (2) provide an adequate supply of agricultural products by practices that will maintain a permanent and effective agriculture; (3) improve the nutrition and well-being of the American people; (4) improve living in rural America; and (5) strengthen the Nation's balance of payments. The research applies to a wide range of goals; commodities; natural resources; fields of science; and geographic, climatic and environmental conditions.

As the Department of Agriculture's largest in-house research agency, ARS has major responsibilities for conducting and leading the national agricultural research effort. ARS provides initiative and leadership by providing:

* Research on broad regional and national problems.
* Research to support Federal action and regulatory agencies.
* Expertise to meet national emergencies.
* Scientific resources to the Executive Branch and Congress.

ARS is responsible for conducting research under each of the following major program activities:

- Research to develop new knowledge to better manage and enhance the Nation's soil, water, and atmospheric resources to optimize agricultural productivity and environmental quality.
  Conserving and enhancing the Nation's soil, water, and air resources requires the development of guidelines that evaluate the impact of current practices and assesses the potential effect of changing practices on the quality and productive capacity of these resources. Research stresses the discovery of knowledge and its integration into agricultural land management systems that can be used to maintain and enhance farm profitability while reducing or reversing adverse impacts on long-term productivity and the environment. Management practices are being developed that make better use of available water resources, enhance soil quality and reduce erosion, improve nutrient use efficiency, and provide an optimum environment for crop growth: protect the quality of the Nation's water resources and conserve its quantity; and that are economically viable. Improved understanding of the effects of global change on the natural resources are stressed, as is devising appropriate response measures to global change. The impact of air quality on agricultural production and the effect of agricultural practices on air quality and sustainability of agricultural systems are evaluated in the research programs.

- Research to expand the knowledge and technology base necessary to maintain and increase the productivity and quality of crop plants.
  This research places emphasis on improving the efficiency of crop production and the quality of market products to meet processor and consumer needs, and maintaining and improving the competitiveness of U.S. agricultural products in the domestic and world markets. Research is conducted on a broad range of crops including grains, oilseeds, sugar crops, fruits, vegetables, ornamentals, forage, range, and industrial crops. The National Plant Germplasm System provides the foundation for genetic improvement and encompasses the acquisition, preservation, evaluation, and enhancement activities necessary to properly utilize plant germplasm. Biologically-based technologies are being used in integrated pest management systems to protect plants from diseases, insects, and weeds with reduced dependence on agricultural chemicals. Special emphasis is placed on sustainable agricultural production systems that are effective, profitable, and protective of soil, air, and water resources.

- Research to provide new knowledge and technology to maintain and increase productivity and quality of animals and animal products.
  The research program places primary emphasis on improving the efficiency of livestock, poultry, and aquaculture production while simultaneously improving the quality of the end product. The total effort is designed to solve both short and long-term, high priority national problems and to address the needs of action and regulatory agencies. Major thrusts include improving the productivity of animals; assuring the quality and safety of animal products used as food for humans; and reducing losses due to pathogens, diseases, parasites, and insect pests. To accomplish these goals, new technology innovations are needed to preserve and effectively utilize animal germplasm; understand how specific genes improve production, reproduction, and animal product quality; enhance genetic resistance to diseases; improve techniques to rapidly diagnose, prevent, manage, or eliminate diseases, parasites, and insect pests: and detect and control microbial and chemical residue contamination in live animals and animal products. Research is currently underway to more rapidly change genetic makeup of animals and improve reproductive efficiency and growth potential; improve the nutritional components of animal feedstuffs; genetically reduce lipids in animal products; develop genetically engineered vaccines for protection against pathogens, diseases, parasites, and insect pests; develop new, rapid, and accurate methods of disease diagnosis; improve the safety of animal food products; develop integrated management technologies for insect pests and disease vectors; improve the well-being and humane care of farm animals in production facilities; and develop the means to manage and utilize animal wastes to reduce contamination of surface and groundwater.

- Research to develop and expand technologies necessary to achieve maximum use of agricultural commodities in domestic markets and exports.
  Increasing the economic viability of rural communities and competitiveness of U.S. agriculture by enhancing the quality, assuring the safety, and increasing the use of agricultural materials in products for domestic and global markets is paramount in determining postharvest research strategies.

  Food Safety--Reduction in potential risks for consumers caused by human pathogens in food is a core focus of ARS' food safety program. Much of this research is devoted to all aspects of preharvest and postharvest pathogen reduction. Reduction in risks from naturally-occurring toxicants, mycotoxins, and chemical residues in the food supply is the other major thrust of food safety research. These activities lead to reduced health risks for consumers, and enhanced economic opportunities for farmers and processors.

  Commodity Quality-- Maintenance and enhancement of the quality of U.S. commodities are key factors to increasing domestic and foreign market demand. Technologies to assess and maintain the important physical, sanitary, and performance characteristics of agricultural commodities are essential to enhanced economic opportunities and global competitiveness.

Trade and Quarantine Barriers--Processes to eliminate or control postharvest insects and spoilage organisms are crucial to enhance economic opportunities for U.S. commodities by overcoming regulatory and quarantine trade barriers. Emphasis in the ARS program is on the development of acceptable treatment technologies for agricultural commodities that meet regulatory and quarantine requirements. This enhances global competitiveness and economic opportunities for the U.S. agricultural system, while protecting the environment by devising alternatives to the use of ozone depleting fumigants such as methyl bromide.

New Uses and Process Improvement--The core program has three segments: (1) new products and processes based on vegetable oils, animal fats, oilseed and grain proteins, carbohydrates (starch), and established fibers (cotton and leather); (2) uses for new crops not now grown on a significant scale in the U.S. (guayule, jojoba, lesquerella, kenaf, flax); and (3) biofuels, principally ethanol made from high starch crops and biodiesel made from vegetable oil (soybean) and animal fats. The focus of this research is lower cost processing technologies and new products from agricultural crops to meet domestic and global demands, thus expanding U.S. economic opportunities and enhancing global competitiveness.

- Research to develop new technology essential to improve human health and well-being through improved nutrition.

  USDA has the primary responsibility for developing the fundamental information on human nutrition requirements which provide the basis for development of dietary guidelines and for food assistance programs. As the Federal government's lead agency for human nutrition research, ARS activities are directed toward understanding the effects of diet on healthy human volunteers of all ages. The objectives of the research are to improve human health by defining nutrient requirements to enable robust physical and mental function and resistance to disease and aging degeneration. Other functions of the ARS research include determination of food consumption patterns, development of nutritional status assessment technologies, assessment of nutrient composition of foods, and maintenance of the national Nutrient Database, a compendium in printed and electronic form of available information. Research on strategies to effect public acceptance of change in dietary habits is a new initiative, with regional emphasis on the Lower Mississippi Delta. The knowledge derived from these activities provides multiple benefits to the Nation, in a healthy population, reduced health care costs, longer active life spans, cost-effective food assistance, and improved life.

- Integrate knowledge of agricultural production, processing and marketing into management systems which optimize utilization of users' resources and net returns.

  Finding solutions to important national problems faced by agriculture requires the integration of components of research from all areas of the agricultural and natural resource system. These components include soils, water, climate, plants, animals, insects, diseases, weeds, and people. This research evaluates the interaction of many components that constitute a system, including an agroecosystem, a watershed, or a farm. Systems research integrates results into products that aid or improve the timeliness and pertinence of decisions made by managers of agricultural systems. Discovery and understanding critical gaps in knowledge that can be integrated from ongoing component research into further refinements of systems is a critical aspect of these efforts. Systems research leads to reduced input costs, higher returns, improved product quality, more efficient resource use, reduced environmental impact, and improved sustainability of agricultural production systems that meet long-term societal needs. This research requires multi-disciplinary efforts often located throughout the United States. Team members are linked through national information networks to share concepts and databases required to build and evaluate models. Mathematical models are one of several techniques used to describe real systems. Experiments are performed to understand the system's response over time to alternative environments or management practices. Decision support systems can be devised that integrate available knowledge, simulation models, records of personal experience and observations, and error analysis into systems that permit a manager to compare and evaluate management options.

- Identify, acquire, organize, preserve, and disseminate pertinent food and agricultural information. Overall, the thrust of the National Agricultural Library (NAL) activities is to utilize computer and electronic technologies to provide access to scientific and agricultural information, irrespective of where it resides, to USDA, public organizations and individuals. To this end, NAL is addressing within its strategic plan how it will provide global leadership in identification and implementation of new methods, techniques and technologies to improve access to and management of agricultural information.

  NAL activities continue to rely heavily on incorporation of electronic technologies. NAL has embraced many of the new information technologies and, as a result, many individuals within the agricultural community look to NAL to lead agricultural libraries into the electronic age. Support of the Electronic Information Initiative and Digital Preservation of older materials, has assisted in NAL's progress into the electronic information age.

In addition, ARS appropriated funds are also expended in support of the following:

- Repair and maintenance of facilities. Funds are used to repair and maintain ARS facilities to provide safe, energy-efficient and functional workspace for in-house research. ARS is committed to adequately funding routine maintenance and repair to assure that all facilities are properly maintained. Each location also allocates program funds, as appropriate, to perform the most urgent repairs or maintenance of facilities.

- Contingencies. These funds, established by Congress in fiscal year 1962, provide for contingency financing of urgent items requiring immediate research action, including research demanded by emergency situations, unforeseeable research needed because of unexpected scientific breakthroughs, damaged but urgently needed facilities, and other related needs where time is of the essence. Specific funding for contingencies was not appropriated in FY 2000.

The Department has a central fund to promote facility compliance under the requirement of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation Recovery Act (RCRA). These Acts require Federal agencies to meet the same standards for storage and disposition of hazardous wastes as private businesses. The funds provided for this program enable the Department to address problems posed by past uncontrolled hazardous waste disposal practices and to deal with the regulation of current hazardous substances. Resources are allotted to USDA agencies from the central fund. The Agency supplements these funds as necessary.

ARS' Headquarters offices are located in the Washington, D.C. metropolitan area. The field activities are managed on a national basis through eight Area Offices. Research is conducted at field locations in the United States, District of Columbia, Puerto Rico, the Virgin Islands, and in three foreign countries. Much of the work is conducted in direct cooperation with State agricultural experiment stations, other State and Federal agencies, and private organizations. ARS programs are organized and managed at the National level under 23 national program areas.

As of September 30, 1999, there were 6,407 full-time employees and 1,738 other than full-time employees. Of the total 477 full-time employees and 24 other than full-time employees worked in offices located in the Washington, D.C. metropolitan area.

During FY 1999 the following GAO and OIG reports were completed:

GAO Report: "Antimicrobial Resistance: Data to Assess Public Health Threat From Resistant Bacteria Are Limited," HEHS/NSIAD/RCED-99-132, published on May 25, 1999.

GAO Report: "Federal Research: Peer Review Practices at Federal Science Agencies Vary," RCED-99-99, published on May 24, 1999.

GAO Report: "South Florida Ecosystem Restoration: An Overall Strategic Plan and a Decision-Making Process Are Needed to Keep the Effort on Track," RCED-99-121, published on May 24, 1999.

GAO Report: "U.S. Agriculture: Grain Fungus Creates Financial Distress for North Dakota Barley Producers," RCED-99-59, published on May 24, 1999.

GAO Report: "Food Safety: The Agricultural Use of Antibiotics and Its Implications for Human Health," RCED-99-74, published on May 11, 1999.

GAO Report: "Animal Agriculture: Waste Management Practices," RCED-99-205, published on July 29, 1999.

The following GAO and OIG reports are in progress:

OIG Review: "Review of the Federal Managers' Financial Integrity Act Process."

GAO Review: "Antimicrobial Resistance II."

GAO Review: "Federal Roles in Ensuring Safety of Functional Foods."

GAO Draft Report: "Food Safety: Agencies Should Further Test Plans for Responding to Deliberate Contamination," RCED-00-3.

GAO Review: "Use of Rapid Tests to Screen and Identify Unsafe Foods."

AGRICULTURAL RESEARCH SERVICE

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Salaries and Expenses	$808,518,000	7,301	$834,322,000	7,518	$894,258,000	7,518
Rescission	-22,466,000	--	-3,938,000	--	--	--
Transfer from USIDCA, AID	2,000,000	--	--	--	--	--
Transfer from OSEC for Congressional Relations	129,000	--	--	--	--	--
Transfer from Office of National Drug Control Policy (ONDCP)	4,500,000	--	--	--	--	--
Adjusted Agricultural Research Service	792,681,000	7,301	830,384,000	7,518	894,258,000	7,518
Buildings and Facilities	56,437,000	--	52,500,000	--	39,300,000	--
Total, Agriculture Appropriations	849,118,000	7,301	882,884,000	7,518	933,558,000	7,518
Allocations from:						
Hazardous Waste Management	3,669,124	--	3,350,000	--	6,115,000	--
Obligations under Other USDA Appropriations:						
Agricultural Marketing Service	366,809	2	460,000	2	460,000	2
Animal and Plant Health Inspection Service	6,943,896	21	8,716,000	21	8,716,000	21
Cooperative State Research, Education and Extension Service	4,464,129	14	5,603,000	14	5,603,000	14
Departmental Administration	52,000	--	65,000	--	65,000	--
Economic Research Service	2,918,579	8	3,663,000	8	3,663,000	8
Farm Service Agency	176,880	1	222,000	1	222,000	1
Food Safety and Inspection Service	1,463,048	5	1,836,000	5	1,836,000	5
Foreign Agricultural Service	1,589,894	5	1,996,000	5	1,996,000	5
Forest Service	663,910	2	833,000	2	833,000	2
National Agricultural Statistics Service	3,038,476	9	3,814,000	9	3,814,000	9
Natural Resources Conservation Service	1,064,875	3	1,337,000	3	1,337,000	3
Office of the Chief Economist	80,163	--	101,000	--	101,000	--
Office of the Inspector General	29,775	--	37,000	--	37,000	--
Office of Rural Development Policy	100,000	--	126,000	--	126,000	--

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Other USDA Funds (continued)						
Sale of Animals and Personal Property (Proceeds)	749,395	--	941,000	--	941,000	--
Quarters and Subsistence	169,299	--	212,000	--	212,000	--
Misc, Reimbursements	151,524	--	190,000	--	190,000	--
Total, Other USDA Appropriations	27,691,776	70	33,502,000	70	36,267,000	70
Total, Agriculture Appropriations	876,809,776	7,371	916,386,000	7,588	969,825,000	7,588
Other Federal Funds:						
Department of Commerce	59,182	--	74,000	--	74,000	--
Department of Defense	2,766,619	8	3,473,000	8	3,473,000	8
Department of Energy	1,272,004	4	1,597,000	4	1,597,000	4
Department of Health and Human Services	3,878,064	11	4,868,000	11	4,868,000	11
Department of the Interior	799,962	4	1,004,000	4	1,004,000	4
Department of State	6,481,304	19	8,135,000	19	8,135,000	19
Department of Justice	30,000	--	38,000	--	38,000	--
Department of Transportation	15,260	--	19,000	--	19,000	--
Environmental Protection Agency	2,897,171	8	3,636,000	8	3,636,000	8
General Service Administration	274,821	1	345,000	1	345,000	1
National Aeronautics and Space Administration	1,409,790	4	1,769,000	4	1,769,000	4
National Oceanic and Atmospheric Administration	49,820	--	63,000	--	63,000	--
National Science Foundation	99,875	--	125,000	--	125,000	--
Nuclear Regulatory Commission	38,968	--	49,000	--	49,000	--
Misc, Other Federal Funds	90,283	--	113,000	--	113,000	--
Non-Federal Funds:						
Almond Board of California	78,656	--	99,000	--	99,000	--
Arizona, University of	53,606	--	67,000	--	67,000	--
Arkansas, University of	41,209	--	52,000	--	52,000	--

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Non-Federal Funds: (continued)						
Binational Agricultural Research and Development Agreement (BARD)	275,956	2	346,000	2	346,000	2
Biotechnology Research and Development Corporation (BRDC)	12,400	--	16,000	--	16,000	--
California Strawberry Commission	43,594	--	55,000	--	55,000	--
California, State of	215,202	1	270,000	1	270,000	1
Clemson University	50,247	--	63,000	--	63,000	--
Colorado State University	91,360	--	115,000	--	115,000	--
Cornell University	32,746	--	41,000	--	41,000	--
Cotton Foundation	136,699	--	172,000	--	172,000	--
Cotton Incorporated	571,096	3	717,000	3	717,000	3
Florida, State of	316,978	1	398,000	1	398,000	1
Delaware, University of	46,807	--	59,000	--	59,000	--
Georgia, State of	39,946	--	50,000	--	50,000	--
Georgia, University of	137,344	--	172,000	--	172,000	--
Iowa State University	118,966	--	149,000	--	149,000	--
Kraft General Foods	103,081	--	129,000	--	129,000	--
Lockheed Martin Idaho Tech. Corp.	34,746	--	44,000	--	44,000	--
Maryland, University of	31,601	--	40,000	--	40,000	--
Mississippi, University of	10,606	--	13,000	--	13,000	--
National Space Development Agency of Japan	28,003	--	35,000	--	35,000	--
National Biological Control Institute	13,100	--	16,000	--	16,000	--
Nature, The Conservancy	36,762	--	46,000	--	46,000	--
Nebraska, University of	29,311	--	37,000	--	37,000	--
North Carolina, University of	349,234	2	438,000	2	438,000	2
North Carolina, State of	27,412	--	34,000	--	34,000	--
Oklahoma State University	12,500	--	16,000	--	16,000	--
Oregon State University	10,600	--	13,000	--	13,000	--
Oregon Wheat Commission	34,233	--	43,000	--	43,000	--
Peanut Foundation	10,000	--	13,000	--	13,000	--
Pennsylvania State University	29,805	--	37,000	--	37,000	--
South Carolina Foundation Seed Association	25,502	--	32,000	--	32,000	--
Texas, University of	64,637	--	81,000	--	81,000	--

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Non-Federal Funds: (continued)						
United Soybean Board	34,540	--	43,000	--	43,000	--
Virginia Polytechnic Institute	23,681	--	30,000	--	30,000	--
Wisconsin, University of	54,840	--	69,000	--	69,000	--
Misc, Non-Federal Funds	390,444	--	490,000	--	490,000	--
Miscellaneous Contributed Funds:	20,239,918	106	23,000,000	106	23,000,000	106
Total, Agricultural Research Service	920,830,267	7,545	969,234,000	7,762	1,022,673,000	7,762

AGRICULTURAL RESEARCH SERVICE

Permanent Positions by Grade and Staff-Year Summary
1999 Actual and Estimated 2000 and 2001

Grade	1999 Actual			2000 Estimate			2001 Estimate		
	Head-quarters	Field	Total	Head-quarters	Field	Total	Head-quarters	Field	Total
ES-6	1	1	2	1	1	2	1	1	2
ES-5	2	3	5	2	3	5	2	3	5
ES-4	1	7	8	1	7	8	1	7	8
ES-3	4	10	14	4	10	14	4	10	14
ES-2	3	7	10	3	7	10	3	7	10
ES-1	--	3	3	--	3	3	--	3	3
GS/GM-15	43	469	512	43	469	512	43	469	512
GS/GM-14	38	574	612	38	574	612	38	574	612
GS/GM-13	106	584	690	106	584	690	106	584	690
GS-12	98	604	702	98	704	802	98	704	802
GS-11	22	513	535	22	513	535	22	513	535
GS-10	1	14	15	1	14	15	1	14	15
GS-9	33	795	828	33	795	828	33	795	828
GS-8	16	344	360	16	344	360	16	344	360
GS-7	50	632	682	50	692	742	50	692	742
GS-6	50	507	557	50	547	597	50	547	597
GS-5	22	370	392	22	370	392	22	370	392
GS-4	11	84	95	11	84	95	11	84	95
GS-3	4	16	20	4	16	20	4	16	20
GS-2	1	22	23	1	22	23	1	22	23
GS-1	--	1	1	--	1	1	--	1	1
Other Graded Positions	4	44	48	4	44	48	4	44	48
Ungraded Positions	--	524	524	--	524	524	--	524	524
Total Permanent Positions	510	6,128	6,638	510	6,328	6,838	510	6,328	6,838
Unfilled Positions end-of-year	-63	-168	-231	-63	-168	-231	-63	-168	-231
Total Permanent Full-Time Employment, end-of-year	447	5,960	6,407	447	6,160	6,607	447	6,160	6,607
Staff Year Ceiling	470	7,075	7,545	470	7,292	7,762	470	7,292	7,762

AGRICULTURAL RESEARCH SERVICE

Classification by objects
1999 Actual and Estimated 2000 and 2001
(Dollars in thousands)

		1999	2000	2001
Personnel Compensation:				
Headquarters		$65,019	$69,395	$72,772
Field		286,666	305,916	320,803
11	Total personnel compensation	351,685	375,311	393,575
12	Personnel benefits	81,465	87,452	91,884
13	Benefits for former employees	253	--	--
	Total pers. comp. & benefits	433,403	462,763	485,459
Other Objects:				
21	Travel	15,795	16,997	17,968
22	Transportation of things	1,649	1,915	2,141
23.2	Rent paid to others	1,232	1,532	1,713
23.3	Communications, utilities and misc. charges	30,749	31,159	34,709
24	Printing and reproduction	1,166	1,330	1,487
25.1	Advisory and assistance services	144	203	203
25.2	Other services	55,924	33,903	34,618
25.3	Purchases of goods and services from Government Accounts	4,623	4,410	4,928
25.4	Operation and maintenance of facilities	25,776	27,093	30,284
25.5	Research and development contracts	119,203	125,400	141,163
25.6	Medical care	170	200	225
25.7	Operation and maintenance of equipment	5,617	6,019	6,727
25.8	Subsistence and support of persons	1,096	1,237	1,381
26	Supplies and materials	70,812	72,023	75,200
31	Equipment	45,366	47,450	51,400
32	Land and structures	24,711	45,751	42,371
41	Grants, subsidies, and contributions	25,020	16,645	20,781
	Total other objects	429,053	433,267	467,299
Total direct obligations		862,456	896,030	952,758
Position Data:				
Average Salary, ES positions		$117,692	$124,518	$130,373
Average Salary, GS positions		$50,358	$53,279	$55,783
Average Grade, GS positions		10.0	10.0	10.0
Average Salary of Ungraded positions		$32,296	$34,169	$35,775

Note: Includes Salaries and Expenses and Buildings and Facilities Obligations.

AGRICULTURAL RESEARCH SERVICE

PASSENGER MOTOR VEHICLES

The Agricultural Research Service (ARS) passenger motor vehicle fleet is almost exclusively used by professional research investigators and technical personnel. In the course of their daily work, research personnel may need to travel to individual farms, ranches, commercial firms, State agricultural experiment stations, research fields, etc. In this type of work a high degree of mobility is necessary. Using common carriers is not feasible. Comparative studies of cost requirements involved in the use of private and Government vehicles show that it is more economical to have Government vehicles available than it is for reimbursement for using privately-owned vehicles.

It is ARS policy to pool the use of motor vehicles for different activities in order to keep the number of vehicles to a minimum and reduce the overall operation and maintenance costs. The agency requires vehicle operational reports and makes periodic surveys to determine the extent to which vehicles are being used and their condition.

Replacement of passenger motor vehicles. ARS proposes to replace 46 of the 377 passenger vehicles currently in operation. These vehicles are assigned to ARS locations and are used in connection with research studies and technical assistance. Vehicle replacement is based on funding priority, program management, vehicle mileage, and vehicle age. Federal regulations establish the minimum replacement standards that allow Agencies to replace passenger vehicles when the vehicle is 3 years of age or has 60,000 miles. Agencies can retain vehicles that meet the minimum replacement standards if the vehicle can be operated without excessive maintenance costs or substantial reduction in resale value.

Age and mileage data for passenger motor vehicles on hand as of September 30, 1999 are as follows:

Age Data			Mileage Data		
Age-Year Model	Number of Vehicles	Percent of Total	Lifetime Mileage (thousands)	Number of Vehicles	Percent of Total
1994-5 or older	247	65	Over 100	23	6
1995-4	36	10	80-100	35	10
1996-3	17	5	60-80	54	14
1997-2	46	12	40-60	84	22
1998-1	15	4	20-40	97	26
1999	16	4	Under 20	84	22
Total	377	100	Total	377	100

AIRCRAFT

ARS currently maintains a fleet of six aircraft which are located at College Station and Weslaco, Texas. These aircraft have been specially modified and equipped for research for pest control methods, application of agricultural materials, radar tracking of airborne insect migration, infrared and color photography, and evaluating effects of weather on agriculture.

There are no planned replacements for these aircraft.

AGRICULTURAL RESEARCH SERVICE

Proposed Language Changes

The estimates include appropriation language for this item as follows (new language underscored; deleted matter enclosed in brackets):

Salaries and Expenses:

For necessary expenses to enable the Agricultural Research Service to perform agricultural research and demonstration relating to production, utilization, marketing, and distribution (not otherwise provided for); home economics or nutrition and consumer use including the acquisition, preservation, and dissemination of agricultural information; and for acquisition of lands by donation, exchange, or purchase at a nominal cost not to exceed $100, and for land exchanges where the lands exchanged shall be of equal value or shall be equalized by a payment of money to the grantor which shall not exceed 25 percent of the total value of the land or interests transferred out of Federal ownership, [$834,322,000] $894,258,000: Provided, That appropriations hereunder shall be available for temporary employment pursuant to the second sentence of section 706(a) of the Organic Act of 1944 (7 U.S.C. 2225), and not to exceed $115,000 shall be available for employment under 5 U.S.C. 3109: Provided further, That appropriations hereunder shall be available for the operation and maintenance of aircraft and the purchase of not to exceed one for replacement only: Provided further, That appropriations hereunder shall be available pursuant to 7 U.S.C. 2250 for the construction, alteration, and repair of buildings and improvements, but unless otherwise provided, the cost of constructing any one building shall not exceed [$250,000] $375,000, except for headhouses or greenhouses which shall each be limited to [$1,000,000] $1,200,000, and except for 10 buildings to be constructed or improved at a cost not to exceed [$500,000] $750,000 each, and the cost of altering any one building during the fiscal year shall not exceed 10 percent of the current replacement value of the building or [$250,000] $375,000, whichever is greater: Provided further, That the limitations on alterations contained in this Act shall not apply to modernization or replacement of existing facilities at Beltsville, Maryland: Provided further, That appropriations hereunder shall be available for granting easements at the Beltsville Agricultural Research Center, including an easement to the University of Maryland to construct the Transgenic Animal Facility which upon completion shall be accepted by the Secretary as a gift: Provided further, That the foregoing limitations shall not apply to replacement of buildings needed to carry out the Act of April 24, 1948 (21 U.S.C. 113a): Provided further, That the foregoing limitations on purchase of land shall not apply to the purchase of land at Corvallis, Oregon; Parlier, California; and Florence, South Carolina: Provided further, that funds may be received from any State, other political subdivision, organization, or individual for the purpose of establishing or operating any research facility or research project of the Agricultural Research Service, as authorized by law. None of the funds in the foregoing paragraph shall be available to carry out research related to the production, processing or marketing of tobacco or tobacco products.

In the fiscal year [2000] 2001, the agency is authorized to charge fees, commensurate with the fair market value, for any permit, easement, lease, or other special use authorization for the occupancy or use of land and facilities (including land and facilities at the Beltsville Agricultural Research Center) issued by the agency, as authorized by law, and such fees shall be credited to this account, and remain available until expended, for authorized purposes.

The first change is requested to increase the funding limitation for constructing any one building from $250,000 to $375,000. This amount has not changed in over 10 years and the increase is required to meet increased construction costs.

The second change is requested to increase the funding limitation for construction of headhouses or greenhouses from $1,000,000 to $1,200,000. This amount has not changed in over 10 years and the increase is required to meet increased construction costs.

The third change is requested to increase the funding limitation for 10 buildings to be constructed or improved from $500,000 to $750,000 each. This amount has not changed in over 10 years and the increase is required to meet increased construction costs.

The fourth change is requested to increase the funding limitation for altering any one building from $250,000 to $375,000. This amount has not changed in over 10 years and the increase is required to meet increased construction costs.

The fifth change is requested to provide for the authority to purchase land at Corvallis, Oregon; Parlier, California; and Florence, South Carolina. Additional land, in the amount of 60 acres, is needed to support research for the Horticultural Crops Research Unit, National Clonal Germplasm Repository, and Forage Seed and Cereal Research Unit located in Corvallis, OR. Oregon State University's farms are all operating at full capacity and they cannot meet the needs of ARS. The land is needed to conduct pathology, entomology and breeding research on small fruits and nursery crops as well as grass breeding and farming systems research. Also, an additional 100 acres is needed for research to be conducted at Parlier. Property previously used in Fresno will no longer be available and there is not sufficient land at the Parlier site to accommodate current research needs. The expanded needs at Parlier are driven by new critical research on Citrus Tristeza and Plant Germplasm. In addition, the Coastal Plains Soil, Water, and Plant Research Center in Florence, South Carolina has the need to purchase 10 acres of land, in two contiguous 5-acre parcels, next to ARS' current site. ARS has leased one of the parcels for field plots for the past 25 years. Acquisition would ensure continued use of the 5-acre field plot site as well as provide additional land to enhance ARS' research with intensive instrumentation and evaluation.

AGRICULTURAL RESEARCH SERVICE

Lead-Off Tabular Statement

SALARIES AND EXPENSES

Appropriations Act, 2000		$834,322,000
Budget Estimate, 2001		894,258,000
Increase in Appropriation		+59,936,000
Adjustments in 2000:		
Appropriations Act, 2000	$834,322,000	
Rescission	-3,938,000	
Adjusted Base for 2000		$830,384,000
Budget Estimate, 2001		894,258,000
Increase above Adjusted 2000		+63,874,000

AGRICULTURAL RESEARCH SERVICE

SUMMARY OF INCREASES AND DECREASES
(On basis of appropriation)

Item of Change	2000 Estimated	Pay Costs	Program Changes	2001 Estimated
Research on Soil, Water, and Air Sciences	$88,642,000	+$978,000	+$20,292,000	$109,912,000
Research on Plant Sciences	295,875,000	+3,463,000	+548,000	299,886,000
Research on Animal Sciences	133,064,000	+1,619,000	+6,579,000	141,262,000
Research on Commodity Conversion and Delivery	172,114,000	+1,723,000	+9,752,000	183,589,000
Human Nutrition Research	72,420,000	+300,000	+17,053,000	89,773,000
Integration of Agricultural Systems	30,857,000	+215,000	-850,000	30,222,000
Agricultural Information and Library Services	19,150,000	+202,000	+2,000,000	21,352,000
Repair and Maintenance of Facilities	18,262,000	--	--	18,262,000
Total Available	830,384,000	+8,500,000	+55,374,000	894,258,000

PROJECT STATEMENT
(on basis of adjusted appropriation)

	1999 Actual		2000 Estimated		Increase or Decrease	2001 Estimated	
	Amount	Staff Years	Amount	Staff Years		Amount	Staff Years
1. Research on Soil, Water, and Air Sciences	$81,728,504	870	$88,642,000	888	+$21,270,000 (1)	$109,912,000	960
2. Research on Plant Sciences	295,323,321	3,112	295,875,000	3,148	+4,011,000 (2)	299,886,000	3,037
3. Research on Animal Sciences	119,210,724	1,410	133,064,000	1,450	+8,198,000 (3)	141,262,000	1,460
4. Research on Commodity Conversion and Delivery	156,227,145	1,528	172,114,000	1,623	+11,475,000 (4)	183,589,000	1,619
5. Human Nutrition Research	66,868,776	261	72,420,000	280	+17,353,000 (5)	89,773,000	318
6. Integration of Agricultural Systems	29,719,456	193	30,857,000	199	-635,000 (6)	30,222,000	188
7. Agricultural Information and Library Sciences	19,846,475	171	19,150,000	174	+2,202,000 (7)	21,352,000	180
8. Repair and Maintenance of Facilities	18,257,765	--	18,262,000	--	--	18,262,000	--
9. Contingencies	-- a/	--	--	--	--	--	--
10. Collaborative Research Program	2,000,000	--	--	--	--	--	--
11. Unobligated balance	3,498,834	--	--	--	--	--	--
Total Available or Estimate	792,681,000	7,545	830,384,000	7,762	+63,874,000	894,258,000	7,762
Transfer from Office of Congressional Relations	-129,000	--	--	--			
Transfer from Agency for Int'l. Development (AID)	-2,000,000	--	--	--			
Transfer from the Office of National Drug Control Policy (ONDCP) for Anti-Drug Research and Related Matters	-4,500,000	--	--	--			
Emergency Supplemental Appropriations for Counter Drug Research and Development	-23,000,000	--	--	--			
Rescission	22,466,000	--	3,938,000	--			
Total Appropriations	785,518,000	7,545	834,322,000	7,762			

a/ Obligations incurred under the Research Contingency Fund in 1999 amount to $928,523 and are reflected in the program activities listed above.

Agricultural Research Service: FY 2001 Proposed Budget Increases by ARS Objective								
New Areas of Emphasis	Soil, Water, & Air Sciences	Plant Sciences	Animal Sciences	Commodity Conversion & Delivery	Human Nutrition	Integration of Agricultural Systems	Information & Library	Total Increase
• Emerging & Exotic Diseases		608,000	3,750,000					4,358,000
• Agricultural Genomes		3,250,000	1,500,000	600,000				5,350,000
• Human Nutrition Initiative					17,250,000			17,250,000
• Invasive Species (Weeds/Pests)		4,300,000						4,300,000
• Food Safety			2,860,000	2,860,000				5,720,000
• Food Quality Protection Act		4,537,000						4,537,000
• Air Quality	2,000,000							2,000,000
• Agricultural Genetic Resources		5,600,000	1,000,000					6,600,000
• Bioterrorism			10,000,000					10,000,000
• Biobased Products/ New Uses				14,000,000				14,000,000
• Integrated Science for Ecological Challenges	6,800,000							6,800,000
• Global Climate Change	7,900,000							7,900,000
• Climate Change Technology	7,000,000							7,000,000
• Research Information							2,000,000	2,000,000
TOTAL	**23,700,000**	**18,295,000**	**19,110,000**	**17,460,000**	**17,250,000**	**0**	**2,000,000**	**97,815,000**

AGRICULTURAL RESEARCH SERVICE

PROPOSED INCREASES AND DECREASES--PROGRAMS

OBJECTIVE 1: SOIL, WATER, AND AIR SCIENCES

1) A net increase of $21,270,000 for research on Soil, Water, and Air Sciences consisting of:

a) An increase of $978,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $2,000,000 for research in support of Air Quality.

Explanation of Change.

With the adoption of EPA's National Ambient Air Quality Standards, the role of agriculture in polluting air and in turn being affected adversely by air of low quality was raised to a high level of visibility. Even in 1996, concerns about the regulation of agricultural air quality prompted establishment of the Agricultural Air Quality Task Force (AAQTF) in conformance with Section 391 of the Federal Agriculture Improvement and Reform Act. In 1998, the Secretary of Agriculture reconstituted the AAQTF with twenty-three members, including its chair, the Chief of the Natural Resources Conservation Service. The AAQTF has requested that the Secretary of Agriculture and the Administrator of EPA each establish a $20 million initiative for research on agricultural air quality problems, the number one priority being emission of particulates.

Particulate matter of less than 10 micrometers in size penetrates human lungs and allegedly causes a number of ailments. There has been increasing concern about particulates in the 2.5 micrometer size range, which can result from the chemical reaction of ammonia and other volatilized organic compounds. States are required to regulate particulate matter emissions and develop State implementation plans for areas that do not meet standards. Odors associated with agricultural animal production operations carry a nuisance classification at present, but evidence is being gathered to show that adverse health effects also occur. Also, elevated concentrations of tropospheric ozone, another air quality issue, can cause significant losses in the yields of some crops.

Outcomes

The proposed research will result in a greater understanding of the processes of dust and odor emissions and the formation of secondary particulates. This information will make it possible to develop technologies to control or mitigate dust and odor emissions. Practices will be established to protect crops against ozone damage. The ultimate outcome is to make economical technologies available to farmers for their use in being better neighbors, and at the same time help them remain competitive.

ARS research in these areas supports Performance Goal 4.1.1.1: demonstrate concepts and on-farm agricultural technologies and management practices that maintain and enhance the environment and natural resource base; Performance Goal 4.1.2.1: documentation of agriculture's effects on the global environment; Performance Goal 4.3.2.1: demonstrate the effectiveness of integrated agricultural production systems in the improvement of natural resources and the protection of the environment; and Performance Goal 4.3.3.1: demonstrate technologies to store, mix, compost, inoculate, incubate, and apply wastes to obtain consistent economic benefits while at the same time minimizing

environmental degradation, nutrient loss, and noxious odors.

Specific Program Thrusts

- **Develop New Knowledge on Particulate Matter and Precursors** ($1,400,000). Emissions of primary particles from agricultural operations, wind storms over agricultural land, and ammonia from agricultural operations as a precursor to secondary particles will be assessed. New knowledge will be sought regarding the factors that influence the occurrence of emissions and their downward travel. The integration of this knowledge will result in control technologies and processes for evaluating various control alternatives.

- **Develop New Knowledge on Emission and Control of Odors** ($300,000). Animal manures will be the primary focus of this research. The goal will be to determine how odors are emitted and how they can be mitigated through management of feeds, manure storage and handling, and manure utilization. A high priority goal is to develop technology for measuring and assessing the presence, strength, and offensiveness of odors so that the impact of emission controls may be documented.

- **Protect Agricultural Crops from the Effects of Tropospheric Ozone** ($300,000). Research will be conducted to understand the biophysical processes by which ozone causes crop damage and the interactions between ozone and environmental factors such as carbon dioxide concentration. Methods and practices will be developed for mitigating deleterious crop effects due to excess concentrations of ozone in the lower atmosphere.

c) An increase of $6,800,000 for research in support of Integrated Science for Ecological Challenges.

Explanation of Change.

When the Nation was founded, there was an abundant supply of clean air and water and a great diversity of plants, animals, and ecosystems. However, since then environmental degradation has depleted many of the natural resources and compromised the productivity and other functions of natural and managed systems. Recognizing these issues, resource managers, public officials, business leaders, and concerned citizens throughout the Nation have begun working toward new approaches for managing regional growth and the use of resources. Central to this strategy is the ability to understand, monitor, and model bio-physical systems.

The proposed research addresses major ecological challenges, stresses that affect the integrity of ecosystem structure and function, and the ability of natural and managed systems to provide goods, services and other benefits. Stresses include changes in land and resource use, introduction of invasive species, input of pollutants and excessive nutrients, extreme natural events, and changes in atmospheric and climate conditions. They often act in concert and their cumulative effect on the Nation's ecological systems are poorly understood. This research relates directly to ARS' programs in water quality and management, soil resources management, grazinglands management, manure and byproduct utilization, and integrated farming systems.

The Federal agencies in the National Science and Technology Council, Committee on Environment and Natural Resources (CENR) propose to begin addressing the issues with a broad coordinated effort entitled "Integrated Science for Ecological Challenges."

Outcomes

The overall goal of this effort is to develop, coordinate, and maintain a national research infrastructure to provide the scientific information needed for effective stewardship of the Nation's natural resources. ARS participation in this initiative will ensure an effective multidisciplinary approach to ecological challenges and provide a link for transferring new science and technology to action

agencies.

ARS research in these areas supports Performance Goal 2.1.2.1: demonstrate new integrated technologies to protect plants, animals, and ecosystems; Performance Goal 4.1.1.1: demonstrate concepts and on-farm agricultural technologies and management practices that maintain and enhance the environment and natural resource base; Performance Goal 4.1.1.2: experimentally demonstrate the appropriateness of watershed-scale technologies and practices that protect the environment and natural resources; Performance Goal 4.1.3.1: demonstrate cropland and grazingland management strategies that improve productivity and efficiency of croplands and grazinglands; Performance Goal 4.2.2.1: improve strategies and technologies that reduce the effects of extreme weather variability; and Performance Goal 4.3.2.1: demonstrate the effectiveness of integrated agricultural producing systems in the improvement of natural resources and protection of the environment.

Specific Program Thrusts

- **Implement the CENR Research and Monitoring Framework** ($600,000).
  Nonpoint sources of pollutants, such as runoff from agricultural, suburban, and urban areas can contribute to environmental degradation. ARS in cooperation with other CENR (Committee on Environment and Natural Resources) agencies, will establish two pilot projects in watersheds where agricultural production contributes to soil, water, and air pollution. These pilot projects will be part of the national Environmental Research and Monitoring Framework. Farm and watershed scale models and decision support systems will be developed and used to recommend practices for managing agricultural production while protecting soil and water resources.

- **Prevent and Control Eutrophication, Harmful Algal Blooms, and Hypoxia** ($3,850,000).
  An "Integrated Assessment of Hypoxia in the Gulf of Mexico," to be released in January 2000, indicates that a nutrient load reduction of 20 to 30 percent would result in a 15 to 50 percent increase in bottom water dissolved oxygen. The report suggests that two primary approaches to reduce nutrient loadings from agricultural sources would improve onsite management practices, and restore and enhance natural off-field denitrification processes. ARS will conduct farm and watershed scale investigations to develop management practices to reduce transport of manure and fertilizer derived nutrients (nitrogen and phosphorus) to ground and surface waters. This research will include development of methods to predict areas in a watershed susceptible to nutrient losses, improve drainage water reuse, and remediate sites with excess nutrient loading. Development of practices to reduce nutrient transport to ground and surface waters will help prevent harmful algal blooms and hypoxia.

- **Improve Livestock Manure Management Systems to Protect Environmental Quality** ($900,000).
  Improved manure management practices and treatment technologies will be developed to protect water and air quality by conserving nutrients during manure handling and storage. Treatment technologies will include methods for improving liquid/solid separation, reducing losses of ammonia and other gases, and transforming and concentrating nitrogen and phosphorus.

- **Manage and Restore Riparian Zones and Coastal Habitats** ($900,000).
  Natural or constructed conservation buffers (riparian areas, wetlands, biofilters, and buffer strips) can remove sediments and contaminants generated by agricultural activities before they reach surface waters. Research will be conducted to determine the effectiveness, design, and management of conservation buffers to reduce environmental hazards and provide wildlife habitat. This research will require an integrated knowledge of plants, microbial processes, soils, landforms and hydrology.

- **Conduct Integrated Ecosystems Risk Assessments** ($550,000).
  Risk assessment results provide a basis for comparing different management options, enabling decisionmakers and the public to make informed decisions about the management of ecological

resources. ARS will play a lead role in the development of integrated management models and decision support systems for risk assessments that link experimental and observational studies across spatial scales to forecast ecosystem responses to multiple stresses. Initial research will focus on risk assessments of NRCS conservation programs.

d) An increase of $7,900,000 for research in support of Global Climate Change.

Explanation of Change.

Agriculture is vulnerable to changes in climate. Rising temperatures, changing amounts and patterns of precipitation, increased variability in weather, and increases in the frequency and intensity of extreme weather events, such as drought and floods are predicted to accompany the intensification of the greenhouse effect. Unless procedures and tools are developed to anticipate and adapt to such changes, there could be negative impacts on crop and livestock production. The changes also would make it more difficult to achieve a number of USDA conservation and environmental goals.

Changes in agricultural land uses and production practices that conserve natural resources appear to be reducing greenhouse gas emissions or removing them from the atmosphere and sequestering them in soils and vegetation as organic carbon. Such reductions in greenhouse gas concentrations mitigate climate change by slowing the rate of global warming. The rates of sequestration have not been quantified for many forage production and cropping systems, soil types, and regional environments in a systematic and comprehensive manner despite the need for accurately predicting future levels of atmospheric greenhouse gases and consequent climate change.

The uncertainty of carbon sequestration in agricultural soils became a critical issue after U.S. negotiators were successful in their efforts to have carbon storage recognized in the Kyoto protocol as a way to reduce greenhouse gas emissions. Additional information is needed for reducing atmospheric levels of greenhouse gases by utilizing management and conservation practices to store carbon in agricultural soils. Rates of agricultural carbon emissions and sequestration must be documented by direct measurement and extrapolation across a broad spectrum of land uses, land management practices, and resource conservation practices that are influenced by regional differences associated with soil properties, climatic conditions, and cropping systems. The long term capacity of agricultural lands to sequester carbon can be determined by comparing the carbon dynamics in different cropping systems that have been maintained at the same sites for decades. The potential for utilizing grazing management and vegetation restoration to enhance rates of carbon assimilation and storage in the soils of rangelands and pastures needs to be evaluated by monitoring carbon dynamics in large scale manipulative experiments and using simulation models currently under development.

Increasing the soil carbon content is a key component in the continued development of approaches to food production that are sustainable and environmentally benign for reasons other than reduction of atmospheric levels of greenhouse gases since carbon content is a principle indicator of soil quality. Enhanced carbon content increases soil water holding capacity, fertility, and tilth. Consequently, identification of ways farmers and ranchers can increase the soil carbon content will contribute to sustainability, environmental quality, and efficiency of crop and livestock production, as well as forestall climate change.

Additional research must also be devoted to understanding climate change effects and identifying options for mitigating impacts on agriculture and food availability. Of special importance, is the possibility of reductions in crop yields due to rising temperatures and changing amounts and patterns of precipitation. A changing climate also may alter competitive relationships between weeds and crops, and the frequency of insect infestations, and the severity of weed infestations which challenges our ability to control pests. The greatest potential for mitigating the effects on agriculture of climate and other environmental changes is found in genetic diversity. It is necessary to identify the

germplasm which is most tolerant to adverse effects and responsive to potentially positive influences, such as rising carbon dioxide levels.

Outcomes

The proposed research will provide scientific information and technology that serves as a basis for selecting among alternative production practices and conservation practices and for optimizing the on-farm flexibility of managers, thereby helping to mitigate potential global change effects. Accurate measurements of greenhouse gas emissions or rates of storage in soils by agricultural activities also will mitigate climate change and assist in the prediction of future greenhouse gas concentrations, improve accuracy of climate change models, and support the formulation of sound climate change policies. Emissions and storage data will be extrapolated to the national scale using appropriate models. Potential participation of agriculture in carbon trading as a component of greenhouse gas reduction strategies will require verification of agriculture's role as both a source and a sink for greenhouse gases.

The proposed research also will provide additional knowledge about the potential impacts of climate change on agriculture, especially the mechanisms of plant responses to rising temperatures and reductions of precipitation. The research will also provide options for adaptation to climate change impacts based upon utilization of genetic tolerance to stress.

The proposed research in these areas supports Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 4.1.2.1: documentation of agriculture's effects on the global environment; and Performance Goal 4.1.2.2: documentation of how changes in the global environment affect agriculture.

Specific Program Thrusts

- **Develop New Information on the Carbon Cycle Research Initiative ($4,700,000).**
  ARS will collaborate with other Federal departments under the auspices of the Carbon Cycle Research Initiative of the U.S. Global Change Research Program to develop needed information concerning the role of agriculture in the carbon balance, and especially to define ways by which farmers and ranchers can store carbon in agricultural soils. Special emphasis will be given to measurements on the effects of management and conservation practices on carbon storage in cropland and grazingland soils, especially the long-term impacts of various tillage, residue management and production systems on the accumulation of soil organic carbon. Basic research will define the mechanisms by which soil carbon is lost to the atmosphere or transferred to stable organic soil carbon pools. ARS also will cooperate with other Federal agencies and its university partners to document rates of emissions of greenhouse gases associated with crop, livestock, and forage production systems, and develop and evaluate methods to reduce them, including rates of methane emissions from ruminant livestock and livestock waste lagoons. Part of the funding for this program will be retained at Headquarters for distribution as needed for up to 27 field sites that will contribute to an ARS network for gathering data.

- **Mitigate Climate Change Impacts on Food Availability ($2,000,000).**
  ARS will expand research to define reductions in seed production of certain crops by elevated temperatures within the range of increases predicted by climate change models. Successful mitigation of this effect of climate change are dependent upon an understanding of the fundamental mechanisms by which temperature stress causes plants to shed immature fruit or fail to develop grain. To date, too little attention has been given to documenting and utilizing the genetic variation among plants within a species to tolerate adverse impacts of climate change or to respond in positive ways to the "fertilization effect" of rising atmospheric carbon dioxide levels. Additional research is also needed to test preliminary indications that competition between crops and weeds, which are mostly of tropical origin in the U.S., will intensify with global warming.

- **Research the Impacts of Atmospheric and Climate Change on Alaskan Agro-Ecosystems** ($400,000).
  Predictions indicating that climate change will be most strongly expressed at high latitudes have been underscored by recent evidence of warming in Alaska. Preliminary evidence suggests that the Alaskan climate is improving for crop production. Unique responses of northern ecosystems to climate change, the direct effects of rising atmospheric carbon dioxide on plant growth, and interactions of these effects are of special scientific interest in Alaska because of the unusual light regime and other abiotic characteristics of Alaskan ecosystems. Experimental hypothesis testing under both controlled and field conditions is required to document the significance of potentially positive responses of Alaskan agriculture and natural ecosystems to climate. Special attention will be given to current climatic limitations to productivity of crops and forages; interactions between warming, rising carbon dioxide levels, and availability of water, nutrients, and light energy; and other aspects that affect the potential of Alaskan interior and coastal regions for increased crop, forage, and livestock production.

- **Conduct U.S. Global Change Research Program National Assessment Activities** ($800,000).
  Assessments and related research play an integrative role across the USGCRP program areas. Assessments assemble and synthesize scientific results, help increase interaction among scientists and the public, and aid in identifying gaps in knowledge. Assessments are increasingly viewed as important vehicles for disseminating information to public policy and decisionmaking communities. The current national assessment of the consequences of climate variability and change for the Nation marks a milestone in the evolution of the Global Change Research Program. First, the addition of assessment activities to the research program satisfies the mandate of the Global Change Research Act of 1990 (P.L. 101-606) to prepare and submit to the President and the Congress "an assessment which integrates, evaluates, and interprets the findings of the program..." Second, the assessment demonstrates a new public-private partnership that links research to the needs of stakeholders by providing managers, policymakers, and the public with information needed to increase resilience to climate variability and cope with climate change.

  The current National Assessment is providing valuable information on the regional and sectoral differences in adapting to climate change and variability and identifying research needs. FY 2001 assessment activities will focus on completing the first national assessment and on continued efforts to involve USDA stakeholders in helping identify risks and opportunities, and make data, research, and information available to better understand the implications of global change on agricultural systems.

e) An increase of $7,000,000 for research in support of Climate Change Technology.

Explanation of Change.

The concentration of greenhouse gases such as carbon dioxide and methane is increasing dramatically as the result of human activities, including agriculture and land use practices. Atmospheric carbon dioxide has increased approximately 33 percent since the start of the industrial revolution; its current level of 360 ppm is higher than at any time during the past 425,000 years. Based on projected increases in fossil fuel consumption, carbon dioxide is expected to double by the end of the 21st century. Methane has increased about 200 percent in the last 100 years. These changes are likely to affect key biogeophysical processes which regulate the cycling of carbon and water between living organisms, land, air, and oceans and that underlie agricultural productivity.

For over 100 years, it has been recognized that atmospheric gases such as carbon dioxide, methane, nitrous oxide, and water vapor absorb and remit infrared radiation coming from the earth, act much like a heat blanket or greenhouse. Without the beneficial action of these greenhouse gases, the earth would be much colder and life very different. But, given the known physical mechanism for trapping

heat, there is significant concern that large increases in these gases will have dramatic, possibly negative, effects on the climate. In addition to higher temperatures, changes in the amounts and pattern of precipitation, and increases in the frequency and intensity of extreme weather events such as drought and floods are being predicted. These projections are accompanied with high levels of uncertainty as well as high levels of risk if incorrect decisions are made.

Agriculture can contribute by making changes in production and land use practices and activities to reduce the emission of greenhouse gases. The practices and activities include biomass conversion to fuels, improved animal management and waste utilization, conservation tillage, and other management practices (cover crops, buffers, etc.) to enhance long-term storage of carbon in soils through the process of phytosynthetic carbon dioxide assimilation, partitioning of carbon to plant roots and the eventual sequestration into soil organic matter. These activities have numerous beneficial side effects, such as increased energy efficiency and improved soil tilth, fertility and water holding capacity. Identification of ways for farmers and ranchers to predict and adapt to climate change and improve and expand biomass for energy will contribute to sustainability, environmental quality, and efficiency of crop and livestock production, as well as forestall potential climate change.

Outcomes

The proposed research will provide scientific information and technology that will serve as a basis for selecting alternative production activities and conservation practices for optimizing the on-farm and ranch flexibility. Accurate measurements of greenhouse gas emissions or rates of storage in soils by agricultural activities will assist in predicting future greenhouse gas concentrations. New technologies will be developed for predicting and adapting to climate change impacts and improving the accuracy of climate change models, thereby supporting the formulation of sound climate change policies. The research also will provide options for estimating the importance of using biomass for energy to mitigate greenhouse gases. All of the research in this initiative benefits agriculture regardless of the degree of climate change, because producers are constantly needing to adjust to the effects weather has on production.

The proposed research in these areas supports Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 4.1.2.1: documentation of agriculture's effects on the global environment; and Performance Goal 4.1.2.2: documentation of how changes in the global environment affect agriculture.

Specific Program Thrusts

- **Develop New Technology for Predicting and Adapting to Global Change Impacts** ($4,000,000).
  New knowledge and modeling technology will be developed to reduce agriculture's vulnerability to a changing environment. Existing gaps in predicting global impacts will be eliminated with accurate simulation models and mid- to long-term data bases required for model calibration and validation. Field experiments will be established to generate response functions for important climate change impacts that have been inadequately explored, such as the effects of changing amounts and patterns of rainfall, increased temperature, and increased pests and insects. Successful mitigation of climate change will depend on a better understanding of fundamental plant biology, such as the mechanisms causing plants to shed immature fruit, or that affect grain development during high temperature stress. The effects of elevated temperatures within the range of increases predicted by climate change models will be researched. Physiological and molecular responses to climate change will also be addressed that will provide new avenues to develop crop germplasm that is tolerant of elevated temperatures, limited soil water, and other implications of a changing climate.

- **Develop New Technologies for Improving and Expanding Biomass for Energy** ($3,000,000).
  Model and intermediate scale systems will be developed for production of biomass from marginal or otherwise unproductive lands. A range of crops, cropping systems, climates and soil

types will be explored. Genetic technology will be introduced in an attempt to improve yield and quality of production for a range of intended uses, including direct combustion, fermentation, and methane generation. New knowledge will improve our ability to estimate the role of biomass in mitigation of greenhouse gas emissions. In addition, the research will improve our capability to predict the effects of global change on the management and conservation of natural resources, including the enhancement of carbon sequestration through the build-up of soil organic matter.

f) A decrease of $3,408,000 in ongoing Soil, Water, and Air Sciences research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Soil, Water, and Air Sciences research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less essential to continue given priorities identified above. The specific projects recommended for reduction or termination under this objective are:

-- Animal waste management
-- Midwest/Midsouth irrigation
-- National sedimentation research
-- New England plant, soil, and water research
-- Plant stress and water conservation research
-- Watershed research
-- Irrigation water and crop management
-- Northern Plains research
-- Sensing technology for site-specific management to protect environmental resources
-- Improving surface water quality with alternative cropping systems

OBJECTIVE 2: PLANT SCIENCES

1) An net increase of $4,011,000 for research on Plant Sciences consisting of:

a) An increase of $3,463,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $608,000 for research on Emerging and Exotic Diseases of Plants.

Explanation of Change.

Exotic and emerging plant diseases pose severe problems throughout the U.S. Their increasing importance may be attributed to the introduction of pathogens into new geographic regions; modification of the environments that favor diseases; changes in crop management practices; genetic shifts in the pathogen population; and other processes that may give them a competitive advantage.

Research and development of new disease management technologies, particularly biologically-based ones such as host-plant resistance, biological control, cultural control, and others must be expanded.

Research on integration of different control technologies into effective, economical, and sustainable disease management systems should be conducted so that practical solutions can be transferred to agricultural producers, processors, land managers, and others.

Outcomes

The proposed research on emerging and exotic plant diseases will enable U.S. farmers to provide healthful food. New and improved methods that are environmentally safe and effective will be developed to manage plant diseases. Preventing the introduction of exotic pathogens and controlling existing ones will help ensure a plentiful, safe, and economical supply of food and fiber for the U.S. and export markets.

ARS research in these areas supports Performance Goal 1.1.2.3: new and improved diagnostic tests are developed and available; Performance Goal 2.1.2.1: demonstrate new integrated technologies to protect plants, animals, and ecosystems; Performance Goal 2.2.1.1: transfer knowledge developed by ARS to industry and regulatory agencies; and Performance Goal 4.3.1.1: deliver integrated pest management strategies that are cost-effective and protect natural resources, human health, and the environment.

Specific Program Thrust

- **Rapidly Identify, Prevent, and Control Emerging and Exotic Plant Diseases** ($608,000). Effective plant disease control depends on accurate and timely identification of the pathogens involved. More sensitive and accurate methods of pathogen identification and detection are needed to safeguard domestic crop production, preserve export markets, and prevent accidental introduction of exotic pathogens. Improved methods of biological control are needed to replace or supplement the use of synthetic pesticides. Research is also needed on improving the efficacy of biological control agents through genetic selection and bioengineering; assessing the influence of weather, soil type, pesticide application, and crop variety on the reliability of biological control; and developing commercially feasible methods to mass produce, store, and apply biological control agents. To identify potential points of control, research is needed on the biology of pathogens, their relationship with host plants, how they move in the field and during commodity storage, and how they survive from season to season. In addition, research is also needed on improving genetic resistance to diseases in plants including identifying and characterizing resistance and the associated genes, and incorporating resistance into plants through conventional breeding and genetic engineering.

c) An increase of $3,250,000 for research in support of **Agricultural Genomes**.

Explanation of Change.

The U.S. agricultural system now faces formidable challenges that can only be met by harnessing the inherent genetic potential of agricultural genetic resources. More rapid and efficient methods are required to characterize, identify and manipulate useful properties of genes and genomes. These new methods, collectively termed "genomics" are critical for developing improved crops and livestock that enable producers to maximize yields of high quality products, but minimize environmental degradation and production costs.

To facilitate more efficient use of time and resources, programs must be established for the collection and handling of sequence information, and the identification and characterization of genes of agricultural importance which are the key to protecting the public's interest. Support for the recently purchased high throughput sequencing (HTS) instruments must be expanded to fully serve ARS. Additionally, adaptation and development of novel bioinformatics systems and software to handle and analyze the data generated will be crucial to the rapid dissemination of data.

Outcomes

The proposed research will provide the means for maintaining and enhancing the quality and safety of the U.S. supply of food, fiber, feed, medicines, biofuels, industrial products, and ornamentals. Agricultural competitiveness in global markets will be increased by: ensuring the continued genetic improvement of crops; assuring a plentiful supply of bees and other insect pollinators of U.S. crops; shielding crops and beneficial insects from genetic vulnerability caused by an inadequate supply of genetic diversity; providing a strategy for maintaining and enhancing the production, quality and safety of U.S. animal based food, fiber, feed and industrial products; and increasing genetic knowledge of pathogenic and beneficial microorganisms, generating data on mechanisms for disease prevention in animals and plants, and enhancing production of new agriculturally-important microbial gene products.

ARS research in these areas supports Performance Goal 1.1.2.1: demonstrate techniques to control or eliminate postharvest insects and diseases, and increase market quality and product longevity; Performance Goal 1.1.3.1: demonstrate postharvest technologies that add value and improve quality; Performance Goal 2.1.3.1: collections of well-documented germplasm of importance to U.S. agricultural security are readily available to scientists and breeders for research and development; Performance Goal 2.1.3.2: documented DNA base sequences of agricultural importance; Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 2.1.3.4: improve methods for identifying useful properties of plants, animals, and other organisms, and for manipulating the genes associated with these properties; and Performance Goal 2.1.4.1: make technologies available for improving productivity, safety, quality, and the security of the agricultural production system.

Specific Program Thrusts

- **Bioinfomatic Tools, Biological Databases, and Information Management Technology** ($1,800,000).
  The proposed research will advance and refine genomic and biological database technology so that database managers, researchers, computer programmers, and genetic resource managers can more effectively and efficiently generate, store, locate, arrange, interrelate, analyze, and communicate the voluminous data issuing from gene sequencing, genomic mapping, and other genomic research. Plant scientists and entomolgists will be trained or retrained to apply this technology to their research and/or genetic resource management programs. As a result, these tools may tangibly enhance the productivity and value of crop improvement, crop and insect (especially bee) genetics, and genetic resource management.

- **Functional Genomic Approaches to Elucidating and Manipulating the Function of Important Genes in Crops** ($1,450,000).
  The proposed research will combine traditional genetic research with new, rapid, computerized high-throughput genetic assays to determine the function of genes newly discovered by genome sequencing projects for rice and *Arabidopsis*. Once their function is known, the genes can be manipulated and regulated in crops. Genes that are linked to or associated with important crop properties, such as disease resistance, will be researched. If the linked genes are also jointly controlled, the common mechanism(s) for this control will be researched. This approach will enable scientists to systematically observe and alter the function of groups of genes that encode many important agricultural traits. Once discovered, these genes must be transferred to the best crop germplasm by conventional crossing or by genetic engineering. The proposed research will develop means of very precisely placing genes of interest onto crop genomes. Researchers can then better exploit scientific knowledge to accelerate progress in improving yield, product quality, vigor, nutritional value, and pest, disease, and stress resistance.

d) An increase of $4,300,000 for research to control Invasive Species (Weeds/Pests).

Explanation of Change.

Invasive weeds and other pest species cost the United States over $122 billion per year. They impact production agriculture, organic farming and small farms, and are second only to loss of habitat in causing negative impacts on environmental areas and loss of biological diversity. There are more than 30,000 invasive species in the United States, many of them undescribed, and the number is growing daily. Their importance to the United States was recognized in February 1999, when the President signed an *Executive Order on Invasive Species*, which established an *Invasive Species Council*, and provided guidance for agencies to increase their efforts to exclude high-priority invasive species not existing in the United States from entering the country, detect and eradicate incipient populations, and manage established species.

Weeds such as purple loosestrife, leafy spurge, salt cedar, Brazilian pepper, yellow starthistle, water hyacinth, downy brome, and melaleuca infest at least 100 million acres in the United States, which is increasing 8 to 20 percent annually. These aggressive, destructive pests are extremely difficult to control, especially since land is owned in checkerboard patterns, and control actions are not coordinated across all parcels. Estimated costs due to weeds are large: a reduction of about 12 percent in crop yields, or about $36 billion annually; 20 percent in forage yields, or about $2 billion annually; and $100 million for aquatic weed control annually. About half of the threatened and endangered plants in the U.S. are primarily at risk because of invasive species. In 1996, USDA approved a *Strategic Plan for Invasive and Noxious Weeds* to help coordinate activities. In 1997, a *National Strategy for Invasive Plant Management* was approved by over 100 public and private groups including USDA. ARS has implemented a similar strategic plan for weed management.

Arthropods, such as silverleaf whitefly and other whiteflies, Asian longhorned beetle, Russian wheat aphid and others are high priority targets for integrated pest management. Arthropod pests destroy 13 percent of crop production each year, costing about $36 billion with invasive arthropods causing about $14 billion of this total. Another $1.5 billion annually is lost to lawn and garden pests. Like weeds, new arthropod pests appear in the U.S. each year.

Outcomes

The proposed research will aid regulatory agencies, like APHIS, in better exclusion of potential invasive species; quicker detection and more efficient eradication of new invading species; and more efficient long-term management of established invasive species. These improvements will result from emphasizing systematics, biologically- based integrated pest management, and ecosystem management.

ARS research in these areas supports Performance Goal 1.1.1.1: demonstrate and transfer to users integrated systems; Performance Goal 1.1.2.3: New and improved diagnostic tests are developed and available; Performance Goal 2.1.2.1: demonstrate new integrated technologies to protect plants, animals, and ecosystems; Performance; Performance Goal 2.2.1.1: transfer knowledge developed by ARS to industry and regulatory agencies; and Performance Goal 4.3.1.1: deliver integrated pest management strategies that are cost-effective and protect natural resources, human health, and the environment.

Specific Program Thrusts

- **Research Systematics of Invasive Weeds and Insects** ($750,000).
  As pesticides are removed from the market, biological control becomes increasingly desirable, as a competitive strategy for use in integrated pest management. Classical biological control, in which natural enemies are imported from other countries, is critically dependent on determining pest origin which requires correct identification of the species. Action agencies (e.g., the Animal and Plant Health Inspection Service) rely on ARS' rapid identification of intercepted pests. However, systematics do not exist for critical groups, such as rust fungi, whiteflies, plant feeding mites, parasitic wasps, and others. Additionally, there is inadequate technical assistance and

operating funds for the researchers, which slows critical identifications at this first line of defense against invasive species.

- **Develop New Biological Information and Species Discovery** ($1,100,000).
Short- and long-term effects of agricultural practices on biological community populations, biological diversity, ecosystem functioning and resilience will be determined. In particular, the role of systematics in biological diversity and integrated pest management of key groups of invasive species will be developed. Computerized tools that locate, correlate, synthesize and report biological information in a useable form will be provided.

- **Develop Integrated Weed Management Systems for Invasive Weeds such as Purple Loosestrife** ($700,000).
Weeds are the major invasive species globally, in terms of direct and indirect economic impacts, pesticide use, and impact on the environment and biological diversity. ARS will continue to develop biologically-based integrated weed management programs that are targeted to specific weeds or weed complexes in specific areas of the country and for specific habitats (e.g., aquatic areas, rangelands, natural areas, row crops, etc.). Examples include purple loosestrife, *Lythrum salicaria*, an invasive Eurasian weed of wetland areas, for which four biological control agent species have been established and cause significant reductions within five years of release. Detailed monitoring of these agents, and revegetation efforts to reestablish valued wetland plants are underway but more effort is required. Similar efforts are underway for other weeds, but need additional support to speed delivery.

- **Formulate and Deliver Pathogens for Biological Control of Insects and Weeds** ($1,750,000).
Pathogens represent an environmentally attractive alternative to chemical pesticides. Previous research has focused on pathogen discovery and proof of efficacy. Based on laboratory studies, there are now many promising pathogens. The main impediment to their use is short shelf life and low field persistence. Means are needed to deliver them to the target pest insects, mites, and weeds. Current methods rely on those used for chemical pesticides. Methods are needed that consider microbe characteristics and special problems such as UV sensitivity, and which have advantages such as the ability to utilize pathogens in an inoculative manner early in the season through dissemination by traps. Two particular pathogen groups are likely to become important in the area of insect (viruses and fungi) and weed (fungi) biological control. Industry has shown considerable interest in microbial agents and is poised to commercialize them once impediments have been successfully addressed.

e) An increase of $4,537,000 for research in support of the **Food Quality Protection Act**.

Explanation of Change.

The provisions of the Food Quality Protection Act of 1996 (FQPA) require EPA to reassess all pesticide tolerances within ten years of passage of the Act and to change its standard for evaluating pesticides from an acceptable risk/benefit profile to a reasonable expectation of no harm. EPA is further required to evaluate the riskiest one-third of currently used pesticides within the next two of years. During the first phase of tolerance reassessment, EPA is reviewing organophosphate, carbamate and B-1/B-2 carcinogens pesticides. This profound change in the evaluation standard is likely to affect the permissible uses in agriculture of many pesticides that can have toxic effects on humans. The new standard of safety will require more precise information on current use patterns, routes of exposure to pesticides, and alternative pest control technologies as reported by the Pesticide Impact Assessment Program and other REE programs.

USDA policy already places high priority on funding, development, and testing of replacement technology for currently used pesticides at risk of being phased out after review by EPA. In addition,

the Department is committed to implementation of IPM practices on at least 75 percent of the Nation's crop acreage by the year 2000 and continuing beyond. The Department also supports efforts to develop areawide pest management programs using biointensive IPM approaches, IR-4 minor use pesticide programs, biological control agents, methyl bromide alternatives, and other IPM components technology that can be used for control of pests as alternatives to chemical pesticides that are at risk from FQPA assessment.

Outcomes

Research funded by the proposed increase will develop and /or demonstrate in IPM field approaches new technology and new management practices to substitute for the use of "hard" pesticides, such as the organophosphate and carbamate insecticides, and will provide new, target specific biointensive approaches to control crop and other agricultural pests. The results of the program will be increased alternative pest management technologies that are demonstrated to be cost-effective, efficacious, environmentally-compatible and sustainable over the long term. At the same time, the proposed work will contribute to the Interdepartmental (USDA, EPA, and FDA) commitment to implement IPM programs on at least 75 percent of the crop acreage by the year 2000 and beyond. The research will also help provide minor-use chemicals and biorationals that can substitute for chemical pesticides at risk.

ARS research in these areas supports Performance Goal 1.1.2.1: demonstrate techniques to control or eliminate postharvest insects and diseases, and increase market quality and product longevity; Performance Goal 4.3.1.1: deliver integrated pest management strategies that are cost-effective and protect natural resources, human health, and the environment; and Performance Goal 4.3.2.1: demonstrate the effectiveness of integrated agricultural production systems in the improvement of natural resources and the protection of the environment.

Specific Program Thrusts

- **Expand Areawide IPM Programs Demonstrating Alternatives to At-Risk Pesticides** ($1,000,000).
  ARS will expand support for its major IPM research and areawide demonstration programs based on the use of biorational and biologically-based strategies for control of key pests where currently organophosphates and carbamates are used primarily as management agents. Because pests are mobile and can enter or leave a test site consisting of a single field, potential IPM technologies must be evaluated in a large-area (ecosystem) setting.

- **Develop IPM Systems for Fruits, Vegetables, and Other Crops Treated with Organophosphates and Carbamates, and for Pests Under Large-Scale Action Agency Eradication or Control Programs** ($417,000).
  ARS will expand its IPM systems research on the use of biologically-based IPM strategies. The research will focus on the development of: improved semiochemical techniques for control of insect pests on fruits and vegetables; ecologically sound IPM technology for managing insect pests of apples in the Eastern U.S.; and biorational techniques to replace malathion for management and eradication of pest insects.

- **Increase Support for the USDA Office of Pest Management Policy** ($1,500,000).
  ARS will increase its support of the USDA Office of Pest Management Policy. This office was established on September 8, 1997, to improve USDA's ability to assess FQPA by improving integration and coordination of pest management and pesticide data programs, and by strengthening communications with the existing network of grower organizations and crop specialists at land-grant institutions. Additional personnel and funds are needed to initiate, support, and oversee Regional Pest Management Centers and for supporting transitional strategies to alternative pesticides.

- **Provide Supporting Registration of Minor-Use Pesticides as Alternatives to Methyl Bromide**

($1,000,000).
Alternative fumigants and pesticides will be needed to control crop diseases, insect pests, and weeds following the mandated withdrawal of methyl bromide. Because methyl bromide is used is almost the only one used for minor crops, IR-4 activities are important for obtaining registration of such chemicals. USDA and EPA have undertaken a concerted effort to identify and expedite the registration of alternatives to methyl bromide. The research will generate the required data, both on residues and on the effectiveness and crop safety for pest control products important to producers of minor food crops and ornamentals.

- **Initiate Research to Develop Alternatives to Methyl Bromide for Floriculture Crops** ($620,000).
The commercial floriculture industry depends on soil fumigation with methyl bromide to control pests, diseases, and weeds. A step-wise phase-out of methyl bromide is scheduled to be completed by 2005. Without suitable alternatives, growers can be expected to use increasing amounts of organophosphates, carbamates, and other pesticides impacted by FQPA. ARS will extend its methyl bromide alternatives research program to floriculture crops.

f) An increase of $5,600,000 for research in support of **Agricultural Genetic Resources**.

Explanation of Change.

The U.S. needs a comprehensive program to maintain: threatened crop germplasm; genetic diversity within animal species to provide abundant high quality food and fiber; and microbial germplasm, including pathogens, and microorganisms that may be useful in bioconversion, bioremediation, or biocontrol. Genetic diversity is critical for further improvement of production efficiency, and for the protection of valuable germplasm from catastrophic events including climatic change and disease epidemics. USDA/ARS will collect and effectively identify, characterize, and incorporate into centralized gene banks, plant, animal, and microbial germplasm and ancillary descriptive data fundamental to their effective use. ARS will encourage germplasm exchange by innovative means to share benefits with other providers. It will distribute research quantities of healthy, pure, and adequately characterized germplasm where appropriate.

Outcomes

The proposed research will maintain in a healthy, pure, secure, but easily accessible form, genetic diversity within agricultural plant species to provide abundant high quality food and fiber. These efforts will strengthen U.S. competitiveness in agricultural, pharmaceutical, and industrial global markets by ensuring continued genetic improvement through an optimal pool of genetic resources, while protecting U.S. agriculture from genetic vulnerability.

ARS research in these areas supports Performance Goal 2.1.3.2: documented DNA base sequences of agricultural importance and Performance Goal 2.1.3.3: release of improved germplasm varieties, and breeds based on effective use of genetic resources.

Specific Program Thrusts

- **Genetic Resource Acquisition and Distribution** ($500,000).
The proposed research will identify threatened germplasm in natural habitats as well as in deteriorating gene banks and incorporate it into USDA/ARS gene banks. When feasible, germplasm will be conserved in nature or in farmers' fields. ARS will encourage germplasm exchange by innovative means of benefit sharing, and distribute research quantities of healthy, pure, and adequately characterized germplasm.

- **Genetic Resource Maintenance and Characterization** ($3,500,000).
The proposed research will maintain germplasm indefinitely in a healthy, pure, secure, but easily

accessible form, and increase its quantity through optimal regeneration techniques. This will include developing more efficient and effective means for multiplying germplasm stored in gene banks and monitoring its viability, health, and genetic content.

- **Genetic Resource Evaluation and Enhancement** ($1,600,000).
The proposed research will thoroughly evaluate (multiple locations and seasons) germplasm for its potential utility in research and identify from that germplasm, identify genes valuable for genetic improvement. The research will also perfect additional evaluation methods which exploit genetic associations between useful traits and DNA markers; record evaluation data on GRIN and/or genome databases; and conduct gene pool enrichment programs for crops that are threatened by genetic vulnerability.

g) A decrease of $17,747,000 in ongoing Plant Sciences research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Plant Sciences research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less essential to continue given priorities identified above. The specific projects recommended for reduction or termination under this objective are:

-- Alternative replacement crops
-- Binational Agricultural Research and Development (BARD)
-- Biological controls and agricultural research
-- Biomedical materials in plants
-- Floriculture and nursery crops
-- Golden nematode
-- Grape rootstock
-- Greenhouse lettuce germplasm
-- Lettuce research
-- Organic minor crop research
-- Red imported fire ants
-- Rice research
-- Risk assessment for Bt crops
-- Root diseases of wheat/barley
-- Small fruits research
-- Southern insect management
-- Sunflower research
-- Sustainable vineyard practices
-- Temperate fruit flies
-- Pacific basin agricultural research
-- Viticulture research
-- Biological control of yellow starthistle and other nonindigenous plant pests in the Western U.S.
-- Defining the molecular mechanisms of heavy metal chilation and sequestration in plants
-- Enhanced production of high-value carotenoids in tomatoes
-- Behavioral ecology and management of crop insect pests with semiochemicals
-- Soybean diseases
-- Genetics of host resistance to pathogens in cereal crops
-- Integrated weed management systems for efficient and sustainable sugarcane production

-- Disease and insect control mechanisms for the enhancement of sugarcane germplasm resistance
-- Improving sugarcane productivity by conventional and molecular approaches to genetic development
-- Appalachian farming systems
-- Biochemistry and molecular biology of natural products for pest control and alternative crops
-- Genetic/physiological parameters that enhance fiber quality
-- Physiology, biochemistry and genetic improvement of horticultural crop productivity and product quality
-- Germplasm evaluation and genetic improvement of oats and wild rice
-- Wild rice breeding and germplasm improvement
-- Small fruit cultural and genetic research in the Midsouth
-- Agronomic and economic evaluation of kenaf as a field crop in Mississippi
-- Plant genetics
-- Exploration and maintenance of fungi and plants for biorational control of agricultural pests
-- Control of fungal pathogens of small grains
-- Evaluation of temperate legumes and warm season grass mixtures in sustainable production systems
-- Development of soybean germplasm and production systems for high yield an drought prone environments
-- Hops genetics and breeding for improved flavor, agronomic performance, and pest resistance
-- Arctic plant germplasm research
-- Genetics and germplasm enhancement of cool season food legumes
-- Role of life strategies of phytopathogenic bacteria in the epidemiology of foliar diseases
-- Physiology of strawberry, blueberry, and other small fruit crops in sustainable production systems
-- Genetic improvement of sorghum for feed quality and agronomic fitness
-- Germplasm resources genetics and physiology of grass and legume seed for sustainable cropping systems
-- Small fruit and nursery research
-- Residue management and grass seed cropping systems for sustainable agriculture
-- Characterization, detection and control of viruses infecting small fruit crops
-- Biology and management of foliage and fruit diseases of horticultural crops
-- Biology and control of insect pests of horticultural crops
-- Preservation of clonal genetic resources of temperate fruit, nut, and specialty crops

OBJECTIVE 3: ANIMAL SCIENCES

1) A net increase of $8,198,000 for research on Animal Sciences consisting of:

a) An increase of $1,619,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $3,750,000 for research on Emerging and Exotic Diseases, and Pests of Animals.

Explanation of Change.

During the past few years emerging and reemerging infectious diseases and pests have become major public health and animal health concerns. Scores of new animal diseases have been recognized in recent years and the reemergence of highly infectious diseases of livestock, poultry and fish have caused many recent epidemics throughout the world. The globalization of trade, increased

international travel, climate change, intensive agriculture, changing agricultural demographics, and practices and product processing are creating new opportunities for the reemergence and spread of infectious diseases and pests. Wildlife species are reservoirs of disease for domestic animals. Control of diseases depends on control in both domestic and wild animals.

The introductions of exotic animal species provides an avenue for introduction of new diseases or pests not present in the U.S. Exotic (non-native) pathogens or pests once introduced into the U.S. can explode into an epidemic due to the absence of natural control agents, lack of resistance by host animals, and limited knowledge to manage the spread of pathogens. Timely and effective control strategies are needed to avoid economic disruptions and lack of consumer confidence, such as that caused by bovine spongiform encephalopathy in the United Kingdom and Europe, swine fever in Europe, and foot-and-mouth disease in Taiwan. These diseases have caused billions of dollars ofin economic losses and resulted in trade embargoes, quarantines, and the destruction of livestock herds and cultivated fish stocks.

Research on diseases is an essential component of national emergency response systems needed to detect new pathogens as they emerge into new disease threats. For emerging diseases and pests to be effectively detected and controlled, the biology of the causal pathogens, pests, and parasites must be understood and strategies developed to limit their establishment and spread.

Outcomes

The proposed research will expand the understanding of disease and pest biology, and the impact on agricultural production systems. New and improved technologies and approaches and environmentally-safe and sustainable practices to manage or exclude disease and pest populations will be developed. Research on exotic and emerging pathogens and pests will lead to better diagnostic tests and improved methods to lessen production losses through the use of improved genetic resistance, biological control, safe and effective vaccines and drugs, and novel management systems based on pathogen weaknesses. These approaches to disease and pest control are expected to enhance food, fiber, and product quality; increase consumer and worker safety; and promote environmental stewardship, while minimizing producer risks and costs of disease and pest control. The proposed research will benefit society by maintaining and improving the ability of farmers to provide consumers with the least expensive and safest food supply in the world.

ARS research in these areas supports Performance Goal 1.1.2.3: new and improved diagnostic tests are developed and available; Performance Goal 2.1.2.1: demonstrate new integrated technologies to protect plants, animals and ecosystems; Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 4.2.1.1: risk-reduction strategies and methods transferred to the Nation's agricultural industry; and Performance Goal 4.3.1.1: deliver integrated pest management strategies that are cost-effective and protect natural resources, human health, and the environment.

Specific Program Thrusts

- **Prevent and Control Emerging Exotic Infectious Diseases of Livestock and Aquaculture** ($1,300,000).
  Novel vaccines including genetic vaccines, and immune modulatory strategies will be developed to prevent outbreaks and the spread of exotic animal diseases, such as classical swine fever. Protecting the U.S. livestock industry from these exotic pathogens will ensure competitiveness of U.S. animals and animal products in the global marketplace. Investigations of pathogen host interactions and genome mapping of the exotic pathogens will help in the development of new DNA-based pathogen detection technologies. Vaccines will be developed and tested to protect American agriculture.

- **Prevent and Control Emerging Domestic Infectious and Zoonotic Diseases of Livestock and Aquaculture** ($900,000).

Expanded research is needed for accelerating the development of information and technologies for protection of U.S. livestock, poultry, and human health against emerging diseases such as avian leukosis. Additional research is also needed for developing diagnostic tests and fundamental information for chronic wasting disease of cervids and other pathies. Research is needed for diseases such as coccidiosis in which drug resistance is emerging.

- **Develop Vaccines for Brucellosis in Wildlife** ($1,000,000).
  Research is needed to develop vaccines for wildlife to control diseases such as brucellosis. Wildlife movement is difficult to control. Domestic animals are exposed to disease from wildlife. Vaccines require novel approaches, such as baits, to introduce the vaccine.

- **Control Livestock Pests** ($550,000).
  The proposed increase will produce new and improved methods for monitoring and control of pest flies of livestock. Research will focus on stable flies and improved traps baited with powerful species-specific attractants. Biologically-based IPM strategies will be developed to control pests. This research program will result in improved pest control technologies and more highly integrated pest control tactics and practices, including their applications on an areawide basis.

c) An increase of $1,500,000 for research in support of Agricultural Genomes.

Explanation of Change.

The U.S. agricultural system now faces formidable challenges such as: climatic extremes; water and soil pollution and degradation; environmental, phytosanitary, and trade regulations which may rapidly complicate agricultural production and processing; new pests and pathogens; adapting to rapidly-changing markets; and extinction or inaccessibility of genetic resources, resulting in increased genetic vulnerability of crops, insects and animals. These challenges can only be met by harnessing the inherent genetic potential of agricultural genetic resources.

More rapid and efficient methods are required to characterize, identify and manipulate useful properties of genes and genomes. New methods, collectively termed "genomics," rely on ever more detailed, accurate, and comprehensive knowledge of genomic organization to efficiently characterize genes and elucidate their function. Genomics and biotechnology are critical for: developing improved crops and livestock that enable producers to maximize yields of high-quality products, but minimize environmental degradation and production costs; improving the efficiency of production, and the quality and safety of food products; improving the accuracy of genetic selection, identifying and moving genes into agricultural populations, and identifying the genes responsible for disease and parasite resistance; and increasing genetic analysis of both pathogenic and beneficial microorganisms, generating data on important virulent genes, determining how these genes may either be utilized or controlled for disease prevention in animals and plants, and producing new agriculturally important microbial gene products.

To facilitate more efficient use of time and resources, programs must be established for the collection and handling of sequence information, and the identification and characterization of genes of agricultural importance. This is key to protecting the public's interest. Support for the recently purchased high throughput sequencing (HTS) instruments must be expanded to fully serve ARS. Additionally, adaptation and development of novel bioinformatics systems and software to handle and analyze the data generated will be crucial to the rapid dissemination of data.

Outcomes

The proposed research will provide the means for maintaining and enhancing the quality and safety of the U.S. supply of food, fiber, feed, medicines, biofuels, industrial products, and ornamentals.

Agricultural competitiveness in global markets will be increased by: ensuring the continued genetic improvement of crops; assuring a plentiful supply of bees and other insect pollinators of U.S. crops; shielding crops and beneficial insects from genetic vulnerability caused by an inadequate supply of genetic diversity; providing a strategy for maintaining and enhancing the production, quality and safety of U.S. animal based food, fiber, feed and industrial products; and increasing genetic knowledge of pathogenic and beneficial microorganisms, generating data on mechanisms for disease prevention in animals and plants, and enhancing production of new agriculturally-important microbial gene products.

ARS research in these areas supports Performance Goal 2.1.3.1: collections of well-documented germplasm of importance to U.S. agricultural security are readily available to scientists and breeders for research and development; Performance Goal 2.1.3.2: documented DNA base sequences of agricultural importance; Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 2.1.3.4: improve methods for identifying useful properties of plants, animals, and other organisms, and for manipulating the genes associated with these properties; and Performance Goal 2.1.4.1: make technologies available for improving productivity, safety, quality, and the security of the agricultural production system.

Specific Program Thrust

- **Livestock and Poultry** ($1,500,000).
  Genomic approaches for improving economically-important traits in livestock and poultry that affect animal health, reproductive efficiency, and yield will be developed. Bioinformatic tools, biological databases, and information management technology to advance and refine genomic and biological database technology will also be developed.

d) An increase of $2,860,000 for research in support of **Food Safety**.

Explanation of Change.

The Presidential food safety initiative recognizes that Americans may be stricken by illnesses caused by the food they consume, and some, mostly the very young and the elderly may die. The REE and ARS Strategic Plan goal of a Safe and Secure Food and Fiber System recognizes that food safety is a continuum involving both plants and animals, and that food safety problems must be addressed and solved from farm-to-table. Safe food will build the confidence that consumers need about the safety of their food supply to prevent disruptions of normal healthy eating patterns. ARS research addresses the continuum by utilizing a farm to table approach that begins in the preharvest period of both crop and animal production to control food contaminants.

Preharvest research is needed to design effective programs to control bacteria and parasites carried by animals that are pathogenic for humans. Exposure and infection of animals by zoonotic pathogens during production and transportation to slaughter is a major source of the contamination in meat-based foods. Pathogens may also contaminate fruits and vegetables produced for human consumption. In addition, antibiotic resistance that is sometimes present in the pathogens must be understood, and technologies developed to extend the useful life of antibiotics including alternatives, such as competitive exclusion and immune system enhancers. Knowledge of pathogen genomics and bioinformatics will accelerate the attainment of these goals. Effective waste handling systems for animal manures must assure that any pathogens present are inactivated. Mycotoxins in grains, forages, and other foods produced by fungi growing on food crops are also a food safety threat, and control programs must start during production by understanding their metabolism and development of host resistance. Other chemical constituents such as toxic metals from soil, and allergens may contaminate commodities and cause concerns for food safety.

Outcomes

The proposed research will result in fewer pathgens in the production environment and greater resistance of both animals and food crops to those that remain. Harvested fruits and vegetables, animals presented for slaughter, and food products from the animals will have fewer pathogens which enhance consumer confidence in food, thus substantially benefitting producers. There will be fewer toxins from fungi or the soil and intrinsic plant constituents to contaminate food products of either plant or animal origin. Substantial benefits to society will result by the prevention of illnesses and deaths. The disruptions in normal, healthy eating patterns resulting from food safety scares will also be avoided.

ARS research in these areas supports Performance Goal 2.2.1.1: transfer knowledge developed by ARS to industry and regulatory agencies.

Specific Program Thrusts

- **Research Antibiotic Resistance** ($1,000,000).
  The effect of gut ecology on the rate of resistance development and transfer among pathogens and nonpathogens in the gastrointestinal tract of poultry, swine, and cattle will be determined. Whether competitive exclusion bacteria can decrease the numbers of background antibiotic resistant bacteria in the gut flora of poultry and swine will be determined. Immune responses of calves to bacterial and parasitic zoonotic pathogens will be enhanced in order to decrease the use of antibiotics.

- **Control Pathogens During Preslaughter and Transportation** ($600,000).
  Pathogens in the gut flora of cattle during the preslaughter period will be controlled through selection of feed ingredients and improved management practices. Develop methods of transporting cattle to slaughter that are not conducive to an increase in pathogen shedding.

- **Control Plant Toxins, Heavy Metals, and Allergens** ($900,000).
  Endophytic competitive exclusion bacteria to control *Fusarium moniliforme* and its associated fumonisin toxins will be developed. The role of fumonisin toxins in the pathogenesis of *F. moniforme* in corn will also be determined. The occurrence of toxic metals on arable soils will be mapped to develop bioremediation methods to control lead and cadmium in food products from plants.

- **Control Salmonella Enteritidis Infection in Laying Hens** ($360,000).
  Eggs are a significant source of Salmonella Enteritidis infection in the food supply. Research will develop management and animal health (including vaccine) practices to reduce Salmonella Enteritidis on and in shell eggs.

e) An increase of $1,000,000 for research in support of Agricultural Genetic Resources.

Explanation of Change.

The U.S. needs a comprehensive program to maintain: threatened crop germplasm; genetic diversity within animal species that provide abundant high quality food and fiber; and microbial germplasm, including pathogens, and microorganisms that may be useful in bioconversion, bioremediation, or biocontrol. Previous support for this type of program has been inadequate, therefore the rate of loss of genetic diversity has rapidly accelerated. Genetic diversity is critical for further improvement of production efficiency, and for the protection of valuable germplasm from catastrophic events including climatic change and disease epidemics. USDA/ARS will collect and effectively identify, characterize, and incorporate into centralized genebanks, plant, animal, and microbial germplasm and ancillary descriptive data fundamental to their effective use. The exchange of germplasm will be encouraged by innovative means of benefit sharing with other providers. Research quantities of healthy, pure, and adequately characterized germplasm will be distributed where appropriate.

Outcomes

The proposed research will combine new genomic tools with conventional approaches to optimally manage plant, animal, and microbial genetic resources by efficiently and effectively: identifying and acquiring animal germplasm with the highest priority, and conversely, deactivating accessions that are genetically redundant; preserving the germplasm's viability, vigor, and health; and propagating germplasm while preserving it true-to-type. Genomic tools and approaches will also help define arrays of animal germplasm accessions optimal for agricultural or industrial evaluation and use. The proposed research will maintain in a healthy, pure, secure, but easily accessible form of genetic diversity within agricultural animal species to provide abundant high quality food and fiber. These efforts will strengthen U.S. competitiveness in agricultural, pharmaceutical, and industrial global markets by ensuring continued genetic improvement through an optimal pool of genetic resources, while protecting U.S. agriculture from genetic vulnerability.

ARS research in these areas support Performance 2.1.3.1: collections of well-documented germplasm of importance to U.S. agricultural security are readily available to scientists and breeders for research and development; Performance Goal 2.1.3.2: documented DNA base sequences of agricultural importance Performance Goal 2.1.3.3: release of improved germplasm varieties, and breeds based on effective use of genetic resources; and Performance Goal 2.1.3.4: improve methods for identifying useful properties of plants, animals and other organisms, and for manipulating the genes associated with these properties..

Specific Program Thrust

- **Maintain Biodiversity in Livestock, Poultry, and Microbes** ($1,000,000).
  The germplasm of livestock and poultry will be acquired, preserved, characterized, documented, evaluated, and enhanced. The germplasm with highest priority for acquisition will be identified and secured, and its viability, vigor, and health preserved. Gene banks and associated infrastructure for maintaining diversity of existing agricultural animal germplasm will be developed. ARS will also genetically evaluate collections of pathogenic microbes to solve problems related to animal health and food safety.

f) An increase of $10,000,000 for research in support of Combating Bioterrorism and Weapons of Mass Destruction.

Explanation of Change.

The proposed research will prepare the U.S. in preventing and dealing with acts of chemical and biological bioterrorism against its agricultural and food security systems. Because of its size, complexity, and integration, compared to other countries, U.S. agriculture is uniquely vulnerable to deliberate introduction of highly infectious diseases and pests, particularly foreign diseases not endemic to the United States. Agricultural exports ($140 billion annually) are the largest positive contributor to the U.S. balance of trade. Protecting U.S. agriculture equates to protecting one of the major infrastructures of the U.S. economy. A recently issued United States General Accounting Office report (GAO report C-RCED-98-1) cites the extensive research efforts some countries have undertaken in developing biological warfare agents directed at animal and plant agriculture. The report indicates that U.S. agriculture is a potential target. Intelligence gathered following the Gulf War and the breakup of the former Soviet Union further confirmed that agricultural commodities and food supplies were targets for foreign bioweapons development. Domestically, USDA endorses the comments in the Attorney General's Five-Year Interagency Counterterrorism and Technology Crime Plan as they apply to agriculture and the Nation's food supply system.

The USDA has successfully and repeatedly prevented widespread damage caused by numerous accidental introductions of nonendemic diseases in the past by quickly controlling outbreaks. Disease outbreaks from the malicious introduction of pathogens could have profound impacts on the national infrastructure, the domestic economy, and export markets. It would negatively affect consumer

confidence in the safety of U.S. products and the government's ability to handle national agricultural disease or toxin emergencies. Such events could circumvent control and prevention measures and quickly overcome the capacity of the present USDA infrastructure. Disease pathogens that could be used to debilitate U.S. agriculture include highly infectious viruses, bacteria, nematodes, fungi and insects that attack major commodities, such as cattle, swine, poultry, cereals, vegetables and fruits, all of which form the basis of the U.S. agricultural economy and our domestic food security.

Apart from actual disease losses, bioterrorism could involve the intentional introduction of diseases and insects which would impact U.S. agriculture through trade disruption. Examples include the Mediterranean and other fruit flies which, if found in the U.S. would immediately affect the export of many commodities, as would the Karnal bunt fungus which could dramatically impact U.S. wheat exports valued at $4 to $5 billion annually. The potential impact of an outbreak of foot and mouth disease in cattle and swine in the U.S. was vividly demonstrated in 1997 in Taiwan where eight million pigs had to be destroyed causing over $5 billion in economic losses, negative environmental consequences, and a total shutdown of their swine product exports. The recent reports of the emergence of a totally new virus called the Nipah virus in Malaysia that infects swine, horses, and kills humans resulted in total depopulation of several million swine and the death of scores of people.

The proposed research program to protect U.S. agriculture will initially focus on developing a forensic capability to rapidly identify highly infectious animal pathogens that intelligence indicates have been turned into weapons. This will require development of extensive genomic databases of highly infectious disease agents. These databases will be used to develop new diagnostic tests based on DNA arrays and high speed detection systems. This new generation of tests will be robust enough for use in the field at the point of monitoring to prevent introduction or at the site of a disease outbreak. It will be critical for rapid emergency disease responses needed to protect U.S. agriculture against bioterrorist introduced diseases. The new tools will permit epidemiological mapping of disease outbreaks and tracking of disease agents to their geographic origin. This information is essential to assist law enforcement agencies in attribution of responsibility.

Outcomes

The proposed research will provide a large and comprehensive molecular genetic database for identification of known highly infectious pathogens and pests. This database will also allow identification of genetically modified organisms. The research will develop rapid and simple diagnostic tools for use by field staff to identify the causes of disease outbreaks and prevent further spread. New diagnostic tests will improve global disease and pest surveillance and enhance international trade. Remote sensing technology and the Geographic Information System (GIS) will provide predictive models for the establishment and spread of newly introduced pests and vectors of disease. These new technologies will enhance U.S. food security and strengthen the Nation's competitiveness in global markets.

Specific Program Thrusts

- **Expand On-The-Spot Diagnostic Capabilities to Include Plant, Animal, and Insect Threats** ($7,000,000).
  The key will be the development of a forensic laboratory with an extensive DNA "fingerprint" of pathogens considered to be potential threats. Diagnostic tests will be developed to identify pathogenic organisms and their toxins and distinguish them from near relatives that are not dangerous. The tests will be simple enough to be performed by field staff at the site of a disease outbreak and results will be available within 30 minutes or less. These tests will provide a panel of DNA chips which do not require the use of highly infectious agents and therefore, will not cause the delays needed to transport samples to biological containment laboratories for diagnosis. ARS will work with the Department of Defense which has made great progress using new rapid computer-based DNA diagnosis of human pathogens.

- **Conduct Epidemiologic Mapping of Microorganisms and Pests to Pinpoint their**

Geographical Origins ($3,000,000).
Databases based on GIS and remote sensing technologies will be established for disease, pest, and vector monitoring. Epidemiologic mapping will determine whether a microorganism or pest is from a population already in the U.S. or whether it came from a foreign source, and if so, which one. It will show where a pest came from and which country was not following its commitments to quarantine treatment of exports. Coupled with this information database will be a prioritized profile on all pathogens considered to have the ability to cause significant damage to U.S. agriculture.

g) A decrease of $12,531,000 in ongoing Animal Sciences research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Animal Sciences research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less essential to continue given priorities identified above. The specific projects recommended for reduction or termination under this objective are:

-- Animal vaccines research
-- Aquaculture research
-- Asian bird influenza
-- Fish diseases
-- Lyme disease
-- Tropical aquaculture feeds and culture technology: Development of shrimp feeds
-- Development of genetically enhanced fish and feeds for aquaculture utilizing specialized grains
-- Formosan subterranean termite control and research demonstration program
-- Ecologically-based technologies for controlling *ixodes scapularis* and reducing lyme disease
-- Catfish genetics and breeding
-- Improve production efficiency in aquaculture
-- Animal health consortium research
-- Risk assessment and integrated termite management strategies for Hawaii and the Pacific Basin
-- National warmwater aquaculture research
-- Warmwater foodfish health management

OBJECTIVE 4: COMMODITY CONVERSION AND DELIVERY

1) A net increase of $11,475,000 for research on Commodity Conversion and Delivery consisting of:

a) An increase of $1,723,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $600,000 for research in support of Agricultural Genomes.

Explanation of Change.

The U.S. agricultural system now faces formidable challenges such as: climatic extremes; water and soil pollution and degradation; environmental, phytosanitary, and trade regulations which may rapidly complicate agricultural production and processing; new pests and pathogens; rapidly changing markets; and extinction or inaccessibility of genetic resources resulting in increased genetic vulnerability of crops, insects, and animals. These challenges can only be met by harnessing the inherent potential of agricultural genetic resources.

More rapid and efficient methods are required to characterize, identify and manipulate useful properties of genes and genomes. New methods, collectively termed "genomics," rely on ever more detailed, accurate, and comprehensive knowledge of genomic organization to efficiently characterize genes and elucidate their function. Genomics and biotechnology are critical for: developing improved crops and livestock for maximizing yields of high quality products, but minimize environmental degradation and production costs; improving the efficiency of production, and the quality and safety of food products; improving the accuracy of genetic selection, identifying and moving genes into agricultural populations, and identifying the genes responsible for disease and parasite resistance; and increasing genetic analysis of both pathogenic and beneficial microorganisms, generating data on important virulence genes, determining how these genes may either be utilized or controlled for disease prevention in animals and plants, and producing new agriculturally important microbial gene products.

To facilitate more efficient use of time and resources, programs must be established for the collection and handling of sequence information, and the identification and characterization of genes of agricultural importance. This is key to protecting the public's interest. Support for the recently purchased high throughput sequencing (HTS) instruments must be expanded to fully serve ARS. Additionally, adaptation and development of novel bioinformatics systems and software to handle and analyze the data generated will be crucial for rapid dissemination of data.

Outcomes

The proposed research will provide the means for maintaining and enhancing the quality and safety of the U.S. supply of food, fiber, feed, medicines, biofuels, industrial products, and ornamentals. Agricultural competitiveness in global markets will be increased by: ensuring the continued genetic improvement of crops; assuring a plentiful supply of bees and other insect pollinators of U.S. crops; shielding crops and beneficial insects from genetic vulnerability caused by an inadequate supply of genetic diversity; providing a strategy for maintaining and enhancing the production, quality and safety of U.S. animal based food, fiber, feed and industrial products; and increasing genetic knowledge of pathogenic and beneficial microorganisms, generating data on mechanisms for disease prevention in animals and plants, and enhancing production of new agriculturally-important microbial gene products.

ARS research in these areas supports Performance Goal 1.1.3.1: demonstrate postharvest technologies that add value and improve quality; Performance Goal 2.1.3.1: collections of well-documented germplasm of importance to U.S. agricultural security are readily available to scientists and breeders for research and development; Performance Goal 2.1.3.2: documented DNA base sequences of agricultural importance; Performance Goal 2.1.3.3: release of improved germplasm, varieties, and breeds based on effective use of genetic resources; Performance Goal 2.1.3.4: improve methods for identifying useful properties of plants, animals, and other organisms, and for manipulating the genes associated with these properties; and Performance Goal 2.1.4.1: make technologies available for improving productivity, safety, quality, and the security of the agricultural production system.

Specific Program Thrust

- **Pathogenic Microorganisms, Beneficial Microbes, and their Products** ($600,000). Virulence-associated, antibiotic resistant, and unique marker genes of pathogenic microorganisms will be characterized to develop novel disease prevention and/or control strategies in plants, animals, and foods.

c) An increase of $2,860,000 for research in support of **Food Safety**.

Explanation of Change.

Postharvest operations (slaughter and processing) are key links in the food safety chain. In many cases, the operations are sources of pathogen contamination of meat, poultry, aquaculture products, and fresh fruits and vegetables. Understanding pathogen transmission during processing is a necessary element to prevent contamination. Postharvest operations can provide an opportunity for removing or inactivating pathogens previously acquired during the production phase. Pathogens can rapidly develop resistance to antimicrobials and traditional control measures. Therefore, successful technologies and strategies to eliminate, reduce, or suppress human pathogens are needed for commodities associated with foodborne illnesses or at risk of becoming vehicles for human pathogens. Development of novel technologies for minimal processing must be based on an understanding of their effect on the microbial ecology of a food product, since suppression of spoilage could create a unique niche for contaminant human pathogens. Rapid and accurate methods of detection, and quantitative measurement of pathogens, toxins, and chemical and drug residues at all critical points during food processing and storage are needed to provide the necessary data to carry out risk assessments, develop and validate predictive microbial models, and identify where interventions are most critically needed.

Outcomes

The proposed research will result in fewer pathogens in the processing environment for foods of plant, animal, and aquaculture origin. Effective handling practices and target treatments for fresh and minimally processed foods will not only result in fewer pathogens, but will maintain the beneficial attributes of foods essential for consumer acceptance and good health. There will also be substantial benefits to society by preventing illnesses and deaths and disruptions in normal healthy eating patterns from food safety scares. Consumer confidence will be enhanced in food products of both plant, animal, and aquaculture origin which will substantially benefit producers.

ARS research in these areas supports Performance Goal 1.1.2.1: demonstrate techniques to control or eliminate postharvest insects and diseases, and increase market quality and product longevity; Performance Goal 1.1.3.1: demonstrate postharvest technologies that add value and improve quality; and Performance Goal 2.2.1.1: transfer knowledge developed by ARS to industry and regulatory agencies.

Specific Program Thrusts

- **Control Pathogens in Fruits and Vegetables** ($400,000).
  Methods to identify and characterize viral pathogens associated with produce will be developed. Extrinsic and intrinsic conditions influencing the survival of viruses, particularly in relationship to biofilm development, will be determined. The role of air, water, and native plants on pathogen transfer to growing produce will also be determined.

- **Control Pathogens in Meat and Poultry** ($900,000).
  The effect of aerosols in poultry and processing will be determined and intervention strategies that may be incorporated into a HACCP plan will be designed. Processing methods that reduce water and chlorine usage without loss of sanitation or decontamination efficacy will be developed. A new program to investigate microbiological hazards associated with slaughtering to meet ethnic requirements and the use of ethnic methods of processing will be developed.

- **Detect Pathogens and Residue During Processing and Storage** ($1,000,000).
  Automated, real-time systems for the on-line detection of fecal and soil contamination, and external and internal damage on fresh fruits and vegetables will be developed. Biosensors to detect the onset of microbial and oxidative spoilage of stored meat products and fruit juices and for chemical and drug residues in food and feeds will be developed.

- **Create Food Safety Databases ($200,000).**
  An Internet-based food safety research information system will be developed as part of the Food Safety Research Information Office established at NAL in FY 1999. It would be used to: provide the research community and the general public with information about proposed projects and those in progress; create analysis and public information products; and provide timely information through electronic networks. This access tool and information will facilitate and advance the ability of the Joint Institute for Food Safety Research to coordinate food safety research by providing a common gateway through which information can be collected from disparate sources and made accessible electronically.

- **Reduce Salmonella Enteritidis in Shell Eggs ($360,000).**
  Salmonella Enteritidis within the egg is a hard to control source of exposure of humans to this pathogen. Research will be directed to improve egg sanitation technologies and storage conditions to reduce egg contamination with Salmonella Enteritidis.

d) An increase of $14,000,000 for research in support of **Biobased Products and New Uses**.

Explanation of Change.

This research proposal is coordinated with a special program initiative that will provide additional resources to enable agencies represented by USDA's Biobased Products Coordination Council to speed the development, commercialization, and adoption of biobased feedstocks and products for use in the United States economy. The initiative supports a renewed sense of urgency and purpose to support research; technical, environmental, and demand analysis; development and demonstration; commercialization assistance; and information delivery on biobased feedstocks and products to meet the needs of potential customers. Biobased feedstocks and products are commercial and industrial products, other than food and feed, that utilize biological products or renewable domestic agricultural (plant, animal, and marine) or forestry materials in their production and manufacture.

The importance and timeliness of this initiative result from the convergence of several important issues. First, there is an urgent need for new products and new uses to expand markets for farm and forest products and to improve farm income, and for postharvest processing and related business activities to increase jobs and income in rural America. Second, there is an increasing concern by policymakers and the public regarding the long-term adverse environmental impacts from the continuing use of nonrenewable fossil resources. Finally, the Nation has a growing dependence on imported sources of energy and industrial feedstocks.

Outcomes

The proposed research is part of a high priority USDA effort to discover, evaluate effectiveness and efficiency, and bring to commercialization an increased number of biobased feedstocks and products that can successfully compete in the marketplace with fossil fuel-based feedstocks and products. Success will increase the use of environmentally preferable feedstocks and products, while reducing the use of those that add global warming gases to the atmosphere which escalates climate change pressures. Success will add new profit potential to old crops and create profitable new cropping options for U. S. farmers. Moreover, adoption of biobased feedstocks and new products will bring growth in processing and manufacturing businesses near to where the crops are grown. This will help fulfill an urgent need for new off-farm jobs and income growth in rural America. The industrial feedstocks and products developed will, in many cases, provide domestically produced and competitive substitutes for imported products resulting in U. S. national security being enhanced and the balance of payments strengthened.

ARS research in these areas supports Performance Goal 1.1.3.1: demonstrate postharvest technologies that add value and improve quality; Performance Goal 1.2.1.1: experimentally demonstrate the

production of new, improved, and alternative crops and horticultural products with potential for successful introduction and demonstrate the successful operation of aquacultural systems; and Performance Goal 1.2.2.1: experimentally demonstrate improvements in processing technologies and develop new bioproducts and uses that have potential to increase demand for agricultural commodities.

Specific Program Thrusts

- **Improve Conversion of Agricultural Materials to Biofuels** ($2,700,000).
  The development and use of biobased fuels will be expanded to decrease dependence on imported petroleum, increase environmental benefits, and improve rural economic stability. Process economics will be improved by developing alternative processing technologies to create 21st century "biorefineries." (Biorefineries refers to creating feedstocks and processes that would allow us to process biomass or biobased feedstocks into finished products or chemical intermediates similar to the way in which crude oil is refined into streams.) Through fundamental biochemical knowledge development and technology breakthroughs, the feedstock range will be broadened and the primary product line expanded to include polysaccharides, oils, and proteins as well as inexpensive biofuels. Economic enzymatic processes for breaking biomass down to its component sugars will be developed. Improved microorganisms which ferment the multiple sugars found in biomass will be genetically constructed. New processing models using environmentally benign bioprocesses and separation methods to produce novel bioproducts having commercially valuable functional properties will also be created.

- **Develop Biobased Materials from Agricultural Commodities and Byproducts Using Biotechnology, Biocatalysis, and Other Integrated Technologies** ($5,600,000).
  Through fundamental breakthroughs in biocatalysis, fermentation, biotechnology, and separation processes, new biobased products with novel functional properties for applications previously unattainable or met only by petroleum derived or other nonbiobased materials will be developed. Selected examples of resultant products include substitutes for imported gums, novel biodegradable polymers, adsorbents, coatings, fibers, and chemical building blocks for industrial and consumer applications. The commodity conversions will be made in environmentally benign, energy efficient, and selective ways.

- **Increase Knowledge of Fundamental Biomaterials Science** ($3,000,000).
  New research at a molecular level will address the ways in which biopolymers and synthetics interact in material blends. Efforts will be intensified to: learn how processing conditions affect the ultimate product; investigate rheological behavior of heterogenous polymers; and undertake computer modeling of biopolymers which promise to provide the road map for a new generation of materials. New research will be initiated to apply combined approaches to the development of polymers derived from a variety of agricultural sources to rapidly create new polymer structures with unique properties including new high performance composites. Crosslinking of nonfood proteinaceous commodities will provide information on strengthening animal fibers and products and how they may form functional composites. Improved methods to measure and analyze biobased components will be developed.

- **Expand Development of Novel Crops for Value Added Products** ($1,200,000).
  New research on novel crops, such as guayule, cuphea, and flax will target development of useful components and feedstocks for new biobased products that will reduce reliance on imports, enhance rural (on-farm) economic development, and provide for agricultural sustainability by using them as rotation crops where feasible.

- **Improve Biomass for Energy** ($1,500,000).
  Renewable bioenergy and bioproduct crops can have significant environmental benefits but need to be capable of being converted to biofuels or bioproducts economically or the crops will not be grown. Feedstock quality will affect conversion efficiency and subsequent profitability of

converting biomass crops to renewable biofuels and bioproducts. Genetic improvement of biomass crop feedstock quality using both conventional and molecular technologies has the potential to significantly improve the economic feasibility of producing fuels and products from biomass crops. Funding will be provided to selected laboratories which are currently working on genetically modifying plants to improve their value for livestock and which already possess the expertise in genetic modification to engineer plants for biofuels and bioproducts. Research will also address development of improved sustainable production management systems for selected energy crops.

e) A decrease of $7,708,000 in ongoing Commodity Conversion and Delivery research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Commodity Conversion and Delivery research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less essential to continue given priorities identified above. The specific projects recommended for reduction or termination under this objective are:

-- Food safety/postharvest technology research
-- Biobased products research
-- Development of natural products research
-- Peanut quality research
-- Postharvest and controlled atmosphere chamber research
-- Develop, evaluate, and transfer technology to improve efficiency and quality of peanuts
-- Biotechnology Research and Development Corporation (BRDC)
-- New crops for industrial products
-- Thermomechanical processing of natural polymers
-- Postharvest handling and mechanization to minimize damage for fruits
-- Improved peanut product quality and bioactive nutrient composition with genetic resources
-- Harvesting and ginning technologies for stripper cotton
-- Comparative textural analysis of fresh and fresh-cut fruits and vegetables
-- Improving quality of fresh and fresh-cut produce by preventing deterioration in cold storage
-- Development of value added products from seed proteins: rheological properties performance
-- Conversion of crops to products with higher added value through directed molecular evaluation

OBJECTIVE 5: HUMAN NUTRITION

1) A net increase of $17,353,000 for Human Nutrition research consisting of:

a) An increase of $300,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $17,250,000 for research in support of **Phase 3 of the President's Human Nutrition Research Initiative.**

Explanation of Change.

A healthy human diet is essential for maintaining the health and vigor of the population and enhancing longevity without risk of chronic disease. The causes of malnutrition and nutritionally related diseases in this country are multiple, complex and not fully understood. Research conducted at ARS' human nutrition research centers has indicated that what and how much is consumed profoundly affects growth, development, and aging. For diseases strongly linked to diet the estimated cost of medical treatment and care exceeds $200 billion per year. Clearly, any progress that can be made to prevent the occurrence of disease through improved diet will be beneficial and cost-effective. The President's human nutrition research initiative was launched in Fiscal Year 1998. The goals of the initiative are to: reduce health care costs and enhance the quality of life by further defining the relationship between diet and health; improve the scientific basis of more effective food assistance programs; generate a more nutritious food supply; improve resistance to infection and immune disorders; promote changes in diet by understanding the factors that affect food choices; and extend dietary guidance to nutritionally vulnerable groups by determining how food consumption at critical points in the life cycle affects risk of disease. In the first phase of the initiative, emphasis was placed on the dietary requirements in children. In the second phase, cutting edge research approaches, such as molecular biology, were applied to human nutrition to identify the role of nutrients to promote health throughout the life cycle. In the third phase, emphasis will be on the identification and measurement of the active components of a healthy diet; determination of the factors that maintain a healthy body weight; the role of diet in the etiology and prevention of bone disease; and importance of diet in maintaining optimal neurological function throughout life.

Outcomes

The proposed research will result in: improved understanding of the factors that control energy balance and tendency for weight gain; greater understanding of changes in body composition throughout the life span; increased brain and cognitive function throughout life; and improved prevention of osteoporosis, bone loss, fracture and disability. The proposed research will also provide information leading to a reduction in the incidence of nutritionally-related diseases, and to a more healthy and productive population. This in turn will lead to a decrease in the staggering costs associated with the treatment of nutritionally-related diseases.

ARS research in these areas supports Performance Goal 3.1.1.1: indicators of function determined and related to diet and health; Performance Goal 3.1.2.1: transfer new measurement techniques and data to users, release results of surveys, and disseminate effective nutrition intervention strategies; and Performance Goal 3.1.3.1: demonstrate improved nutritional quality.

Specific Program Thrusts

- **Update the National Nutrient Databank ($1,650,000).**
  The National Nutrient Databank is the database for the foods consumed in this country and is the foundation for food composition tables throughout the world. All epidemiological examinations of the health effects of diet are dependent on the quality of the data. Nutrition scientists, health educators, and medical practitioners require an accurate database of the nutrient content of foods in order to understand which food choices result in a healthy diet. In addition, having an accurate database is essential for making dietary recommendations since it is necessary to know with certainty which nutrients are contained in particular foods. Despite its position as the preeminent nutrient database, many food items are not included due to the rapid changes in the food supply; in some cases the data are as much as 30 years out of date. The database is in the process of being totally redesigned, but additional food analyses need to be made to keep the data current. Having updated information will ensure that research in nutrition is based on a solid understanding of the nutrient content of foods and that information supplied to consumers is adequate for them to make proper choices from the food information labels.

- **Develop Food Composition Methods ($950,000).**

The maintenance of an accurate nutrient database of food composition is dependent on the availability of accurate and robust methods of analysis for foods. ARS maintains the only laboratory whose mission is to develop new and improved methods of analyses. Concentrating on nutrients suspected to be of importance in terms of human health, new methods of chemical analysis will be developed that can accurately, economically, and quickly determine the levels of a variety of nutrients in foods. The data obtained will be maintained in the National Nutrient Database. Having this information available will enable nutrition researchers to study the relationship between the intake of certain foods and the changes observed in risk factors for various diseases.

- **Determine Healthy Body Weight** ($1,750,000).
Obesity is a major health problem in this country. Although great emphasis has been placed on management of obese individuals and strategies for weight reduction, relatively little is know about health risks associated with mild to moderate increases in weight or the risks associated with being under weight. Whether specific micronutrient needs increase when obese people lose weight and body fat needs to be determined. ARS has the only direct calorimeters in this country for studying energy expenditure in human subjects of all ages. Research will be directed at determination of the true energy expenditures of children, pregnant women, adults, and the elderly with different genetic makeup and patterns of physical activity. By studying the relationship between fetal growth, birth weight, and infant growth, it will be possible to understand how nutrition in early life affects health outcomes later with special reference to degenerative diseases such as diabetes, heart disease and high blood pressure. Additionally, the physiological and neurological regulators of energy consumption and expenditure will be examined to determine how they are linked genetically. The results of this research will help to define healthy weight and help to understand how food consumption and physical activity habits can be modified.

- **Research the Role of Nutrition in Bone Growth and Maintenance** ($3,600,000).
Osteoporosis is a loss of bone mass that affects primarily, but not exclusively, postmenopausal women. It leads to debilitating bone fractures. The estimated annual costs of this disease is over $10 billion for care alone. Research will be conducted to identify the nutritional, biochemical, and hormonal regulators of skeletal mineralization during infancy, childhood and adolescence and how they relate to subsequent development of osteoporosis. Special emphasis will be placed on examining the interplay between physical activity and dietary factors, as well as an examination of the most practical way to assess Vitamin D status in older populations in preventing osteoporosis and bone loss.

- **Develop Biomarkers of Nutritional Status** ($3,000,000).
Nutritionally-related diseases typically develop over a period of many years. Often disease symptoms develop without any prior evidence of the underlying disease, yet very little is known about disease risk prior to that point. Furthermore, many nutritional studies using human subjects are dependent on studying biomarkers to understand the nature of nutritional requirements since it is necessary to ensure that subjects are not exposed to risk while being studied. In order to fully evaluate the role of diet in maintaining health, meaningful measurements of biochemical and physiological function that are related to the nutritional status of an individual and which are indicative of true long term risk for diseases, such as cancer and heart disease, need to be developed. The availability of such biomarkers will be of great benefit to understanding how diet and particular nutrients affect disease risk long before the development of any deficiency symptoms. With such information, nutrition researchers and the health care community will have the ability to accurately predict the long term consequences of diet on individuals.

- **Examine Cognition and Brain Function** ($2,425,000).
There is growing evidence to suggest that what is consumed can affect the development of the central nervous system and have an impact on how well people learn, how they function

mentally, and how the function of the brain deteriorates in many people as they age. However, it is still not clear how the process occurs and what the key steps are in growth, development, and aging that are affected by diet and which might be delayed or prevented by nutritional manipulation. Research will be directed at determination of the environmental, dietary, physiological, and psychological stressors on nutrient requirements for robust mental function. Special emphasis will be placed on defining the key developmental periods for nutritional imprinting that affect the function of the brain later in life, and how diet affects neural development at conception through gestation. The results of this research are critical to understanding how diet might be used to improve mental capacity at all stages of life.

- **Diet and Immune Function** ($2,175,000).
  Infectious diseases are a major cause of mortality and morbidity in all segments of the population. Despite the development of effective antibiotics. The emergence of antibiotic resistant mircroorganisms as well as the appearance of exotic infectious agents, such as HIV, has become cause for alarm. An understanding of how diet affects the immune system is in its infancy, but recent research results from ARS scientists have pointed out for the first time that the nutritional status of a host can affect the disease causing potential of a human pathogen virus. Such results may explain why some infections are benign in certain populations, but cause mortality in others. Additional research will be conducted to determine the effects of diet on the immune system to determine if other infectious agents can also alter their pathogenicity in response to the diet of the host. The mechanism by which diet alters the immune system will be investigated. The results will lead to dietary recommendations that can reduce the incidence of infection and immune related diseases.

- **Role of Nutrition Throughout the Life Cycle** ($1,300,000).
  Childhood development is known to impose the greatest need for nutrients within the life span. However, an understanding of what nutrients are required, their levels in the diet, and at what point in the development process they are critical is incomplete. Similarly, an understanding of the changing need for nutrients that occurs as individuals age is incomplete. Studies will be conducted to determine the relationship between diet and bone and skeletal growth; cognitive and neurological development; and the factors that lead to obesity in children. Nutritional requirements that are needed to delay the onset of diseases associated with aging, such as cardiovascular disease, cancer, Alzheimer's disease, macular degeneration, and osteoporosis will be researched. The results will help form the basis of sound dietary recommendations that meet age dependent needs throughout life. Moreover, in collaborative ARS-wide research the findings also will be used with existing breeding and bio-technologies to develop foods rich in compounds that will promote health.

- **Examine Dietary Survey Methodology** ($400,000).
  Development of feeding programs depends critically on assessment of food consumption by target groups. Current interview methodologies are time consuming and expensive. Research will be conducted to develop telephone surveys to reduce the cost of food consumption surveys and enhance their accuracy.

c) A decrease of $197,000 in ongoing Human Nutrition research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Human Nutrition research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less essential to continue given priorities

identified above. The specific project recommended for reduction or termination under this objective is:

-- Dietary assessments in rural older persons

OBJECTIVE 6: INTEGRATION OF AGRICULTURAL SYSTEMS

1) A net decrease of $635,000 for research on Integration of Agricultural Systems consisting of:

a) An increase of $215,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) A decrease of $850,000 in ongoing Integration of Agricultural Systems research to provide savings to finance higher priority research initiatives.

ARS is recommending the termination of selected research projects within the Integration of Agricultural Systems research program. The savings achieved will be redirected to finance higher priority agricultural research initiatives recommended in the President's budget.

While these projects that have been identified for termination have contributed to the solution of important agricultural problems, they are considered to be less esssential to continue given priorities identified above. The specific projects recommended for reduction or termination under this objective are:

-- Aquaculture systems research
-- Cool and coldwater aquaculture research
-- Potato enhancement research

OBJECTIVE 7: INFORMATION AND LIBRARY SERVICES

1) A net increase of $2,202,000 for Information and Library Services consisting of:

a) An increase of $202,000 for the anticipated FY 2001 pay raise.

These funds are critical to support an effective and responsive USDA in-house research capability. Absorption of the pay costs will result in further erosion of the Agency's capacity to maintain viable research programs. Absorption of these costs ultimately reduces the number of scientists and support personnel, and operating funds essential to carry out national research priorities.

b) An increase of $2,000,000 for **Enhanced Support of ARS Research and Information Programs**.

Explanation of Change.

The NAL print and electronic collections support the information needs of researchers and policymakers in ARS and other USDA agencies. The number and variety of electronic information resources in agriculture continues to increase. Additional funds are required to pay licensing and other costs to ensure that USDA has access to NAL resources. At the same time, the Library must improve access to the printed agricultural literature currently maintained in its collection.

For NAL to continue to provide cost-effective access to the vast quantities of data and information that are vital to the agricultural community, it is essential to capitalize on available and emerging technologies. NAL's existing library management system has been in place more than ten years and is no longer able to meet NAL's current needs.

NAL also must initiate a digital archiving program to ensure that USDA digital publications are accessible far into the future. This initiative will require partnering with USDA agencies, related Federal agencies, and other stakeholders to capture and preserve important electronic agricultural resources.

Outcomes

The proposed increase will ensure that NAL will be able to meet the increasing needs of the agricultural community for rapid delivery of print and electronic information regardless of where it is physically located or maintained. Researchers, educators, policymakers, farmers, and others will have fast, easy, and continuous access to information that enhances economic opportunities, reduces risks, protects natural resources, enhances global competitiveness, and creates a healthier and better educated citizenry.

The proposed increase supports Initiative 2-Performance Goal 2.1.1: implemented selection guidelines for the electronic resources to be acquired and used by NAL; Initiative 2-Performance Goal 2.1.2: expanded representation of electronic formats such as Internet resources, online databases, and digital documents in AGRICOLA and NAL's online catalog; Initiative 2-Performance Goal 2.1.3: a gateway is provided to a large body of electronic information on agriculture over a network such as the Internet; Initiative 2-Performance Goal 2.1.4: demonstrate increased use of agricultural information by institutions of higher education; Initiative 2-Performance Goal 2.2.1: the time for processing requests for services and delivering the information requested is further reduced; Initiative 2-Performance Goal 2.2.2: the gap between the time that information is published and made available in NAL-produced databases is further reduced; Initiative 2-Performance Goal 2.2.3: expanded provision of Internet and other technology-related training programs for NAL customers; Initiative 2-Performance Goal 2.3.1: establishment of a national archive for agriculture literature that serves as a centralized storage facility for archival copies prepared by cooperators in the program; and Initiative 2-Performance Goal 2.3.2: development of a program for monitoring quality of electronically archived materials to ensure that the data remain accessible.

Specific Program Thrusts

- **Provide Access to Research Information** ($1,200,000).
  NAL serves the information needs of USDA, ARS, the land-grant community, agribusinesses, and U.S. consumers. To respond to current and future needs for agricultural information in print and electronic form, NAL requires a funding level that supports the purchase and retention of agricultural information published only in print formats; offsets usage and copyright fees incurred for borrowing or purchasing books and journal articles from external collections and document suppliers; and covers the Library's costs for licensing and extending access to electronic resources to NAL's primary users. Increased funding to support the acquisition of information resources through a combination of access fees and direct purchases is vital to NAL's ability to fulfill its mission to serve the information needs of USDA, ARS, and the Nation.

- **Update and Improve Technology Infrastructure** ($600,000).
  NAL's current information delivery system, which is more than 10 years old, is inadequate to keep pace with the requirements and computer capabilities of the typical USDA bench scientist or administrator. The vast amount of vital information currently produced in digital form, along with telecommunications innovations and the dominance of the Internet, has dramatically increased the amount of agricultural information available electronically. NAL has performed intensive internal reviews of general technical requirements and considerations necessary to manage and disseminate information electronically. Increased funding is essential for NAL to

update hardware, software, and other system features in order to provide satisfactory information services in the 21st century.

- **Preserve USDA Digital Publications** ($200,000).
  Digital publishing is becoming a way of life in USDA. Because of the transitory nature of digital information, a long-term strategy must be implemented to ensure that the growing body of USDA digital publications is systematically archived. Funding at the requested level is necessary in order to address this issue immediately and thereby avoid the irrevocable loss of the Department's electronic publications.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

CONTINGENCY RESEARCH FUND--FY 1999

The Contingency Research Fund, established by Congress in Fiscal Year 1962, is designed to provide an immediate source of funds to meet unforeseen research needs. Releases from the fund are made to respond to emergency funding needs, such as controlling outbreaks of diseases or pest problems or to pursue scientific breakthroughs where it appears inadvisable to wait for consideration of additional funding through the regular budget process. In allocating these funds, the Agency policy is to make no commitment beyond the current fiscal year. Congress did not appropriate specific funding for the Contingency Research Fund in FY 2000.

Releases	Amount
Asian Longhorned Beetle Research	
Beltsville, Maryland	$157,000
Newark, Delaware	43,000
Pheromone/Pink Hibiscus Mealybug Research	
Beltsville, Maryland	155,623
Fresno, California	200,000
Turkey Poults Enteritis Mortality Syndrome	
Athens, Georgia	200,000
Storm damage to vehicle, air handlers and tree	
Gainesville, Florida	32,900
Water damage to building from fire	
Beltsville, Maryland	40,000
Replacement Incinerator (design)	
Laramie, Wyoming	100,000
Total, Contingency Research Fund	928,523

AGRICULTURAL RESEARCH SERVICE
GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

Location	1999 Amount	1999 Staff Years	2000 Amount	2000 Staff Years	2001 Amount	2001 Staff Years
ALABAMA, Auburn	$3,981,666	37	$4,518,800	41	$4,406,300	38
ARIZONA						
Phoenix	7,498,028	104	8,020,800	108	9,613,800	112
Tucson	3,304,041	42	3,190,600	42	3,460,600	42
Total	10,802,069	146	11,211,400	150	13,074,400	154
ARKANSAS						
Booneville	2,733,788	23	2,485,100	23	3,025,100	24
Fayetteville	1,300,167	12	1,500,100	14	1,770,100	12
Little Rock	6,670,359	3	6,969,800	3	10,769,800	3
Pine Bluff	466,554	5	869,000	5	486,500	5
Stuttgart	4,493,656	35	5,336,700	40	4,502,500	38
Total	15,664,524	78	17,160,700	85	20,554,000	82
CALIFORNIA						
Albany	26,852,743	228	27,219,100	233	29,944,700	237
Davis	7,778,312	53	7,475,100	56	10,208,900	58
Parlier	6,881,496	80	6,771,100	80	7,640,200	82
Riverside	4,692,336	48	4,543,100	50	5,398,100	52
Salinas	2,777,249	39	3,352,700	44	2,587,700	39
Shafter	922,536	16	1,041,300	17	1,041,300	17
Total	49,904,672	464	50,402,400	480	56,820,900	485
COLORADO						
Akron	1,252,736	21	1,227,200	22	1,227,200	22
Fort Collins	11,058,386	139	11,675,300	143	13,475,300	143
Total	12,311,122	160	12,902,500	165	14,702,500	165
DELAWARE						
Newark	1,374,000	15	1,327,800	15	1,327,800	15
DISTRICT OF COLUMBIA						
National Arboretum	7,680,407	100	8,143,800	100	8,431,800	100
Headquarters Federal Administration	36,393,091	470	40,299,800	470	40,299,800	470
Centrally Financed Services	10,230,096	--	8,683,200	--	8,683,200	--
Subtotal	46,623,187	470	48,983,000	470	48,983,000	470
Total	54,303,594	570	57,126,800	570	57,414,800	570

AGRICULTURAL RESEARCH SERVICE
GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

Location	1999 Amount	1999 Staff Years	2000 Amount	2000 Staff Years	2001 Amount	2001 Staff Years
FLORIDA						
Brooksville	1,173,625	8	1,250,300	9	1,250,300	9
Canal Point	1,477,865	25	1,484,300	25	1,484,300	25
Fort Lauderdale	1,356,258	13	1,299,200	13	1,299,200	13
Fort Pierce	8,231,466	71	7,152,200	73	7,701,200	74
Gainesville	10,101,939	142	11,392,000	149	10,078,200	143
Miami	2,835,241	31	2,922,200	33	2,809,700	31
Winter Haven	1,246,407	19	1,261,400	19	1,711,400	20
Total	26,422,801	309	26,761,600	321	26,334,300	315
GEORGIA						
Athens	20,360,035	214	22,080,200	226	24,208,700	230
Byron	2,302,822	31	2,732,600	31	2,732,600	31
Dawson	2,689,752	31	3,372,000	35	2,324,000	31
Griffin	1,471,945	18	1,504,600	20	1,819,600	21
Tifton	7,778,516	96	7,456,200	96	8,266,200	97
Total	34,603,070	390	37,145,600	408	39,351,100	410
HAWAII, Hilo	8,636,079	72	9,194,600	76	7,369,400	72
IDAHO						
Aberdeen	2,874,909	22	2,815,000	23	2,876,600	22
Boise	1,832,653	20	1,784,700	20	2,054,700	20
Dubois	1,949,220	17	2,046,400	18	2,046,400	18
Kimberly	2,562,210	35	2,546,300	36	2,816,300	36
Total	9,218,992	94	9,192,400	97	9,794,000	96
ILLINOIS						
Peoria	26,757,266	251	28,134,400	258	29,786,600	265
Urbana	3,710,317	38	3,495,800	39	3,884,800	39
Total	30,467,583	289	31,630,200	297	33,671,400	304
INDIANA, W. Lafayette	5,031,641	46	5,337,700	49	5,337,700	49
IOWA, Ames	29,928,629	344	30,783,200	352	33,345,000	357
KANSAS, Manhattan	8,236,483	77	7,514,200	77	7,784,200	77
LOUISIANA						
Baton Rouge	2,340,058	28	2,208,700	28	2,478,700	28
New Orleans	24,741,535	245	24,589,400	245	20,217,200	240
Total	27,081,593	273	26,798,100	273	22,695,900	268

AGRICULTURAL RESEARCH SERVICE

GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS

1999 Actual and Estimated 2000 and 2001

Location	1999		2000		2001	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
MARYLAND						
Beltsville	122,276,704	1,271	118,791,100	1,285	129,759,200	1,297
Frederick	2,840,057	28	2,516,600	28	2,606,600	28
Total	125,116,761	1,299	121,307,700	1,313	132,365,800	1,325
MASSACHUSETTS, Boston	14,522,419	12	14,880,700	12	16,508,200	12
MICHIGAN, East Lansing	3,870,408	48	3,937,700	48	4,199,100	49
MINNESOTA						
Morris	2,287,981	31	2,628,000	34	2,628,000	34
St. Paul	5,513,460	52	5,195,900	52	6,523,000	55
Total	7,801,441	83	7,823,900	86	9,151,000	89
MISSISSIPPI						
Mississippi State	8,489,295	92	7,361,400	95	7,554,900	95
Oxford	8,209,160	74	9,244,100	79	7,887,600	74
Poplarville	1,511,970	18	1,813,400	20	1,012,900	18
Stoneville	19,088,209	175	21,673,700	186	20,534,900	182
Total	37,298,634	359	40,092,600	380	36,990,300	369
MISSOURI, Columbia	6,399,686	61	7,275,500	67	6,469,900	65
MONTANA						
Miles City	2,310,807	21	2,143,700	21	2,143,700	21
Sidney	4,005,760	33	3,546,600	35	3,242,800	33
Total	6,316,567	54	5,690,300	56	5,386,500	54
NEBRASKA						
Clay Center	14,815,812	133	15,947,100	140	16,757,100	142
Lincoln	4,572,074	62	4,509,200	62	5,505,100	63
Total	19,387,886	195	20,456,300	202	22,262,200	205
NEW MEXICO						
Las Cruces	2,533,069	27	2,369,200	27	2,639,200	27
NEW YORK						
Greenport	8,832,307	55	10,376,800	59	10,286,800	57
Ithaca	7,993,621	48	7,731,400	51	9,362,000	55
Total	16,825,928	103	18,108,200	110	19,648,800	112

AGRICULTURAL RESEARCH SERVICE
GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

Location	1999		2000		2001	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
NORTH CAROLINA						
Raleigh	6,189,784	58	6,313,700	59	5,865,400	55
NORTH DAKOTA						
Fargo	10,201,227	114	10,610,400	117	10,457,400	117
Grand Forks	7,632,034	61	8,092,400	61	9,532,400	63
Mandan	2,570,816	35	2,833,200	36	2,833,200	36
Total	20,404,077	210	21,536,000	214	22,823,000	216
OHIO						
Columbus	793,668	8	734,900	8	1,004,900	8
Coshocton	1,000,698	15	956,600	16	1,226,600	16
Wooster	2,663,879	34	2,335,700	34	2,145,600	33
Total	4,458,245	57	4,027,200	58	4,377,100	57
OKLAHOMA						
El Reno	4,395,258	45	4,657,000	47	5,467,000	48
Lane	1,757,534	24	1,704,900	24	1,704,900	24
Stillwater	2,759,589	32	2,615,000	32	2,615,000	32
Woodward	1,487,934	20	1,525,600	21	1,525,600	21
Total	10,400,315	121	10,502,500	124	11,312,500	125
OREGON						
Burns	909,685	5	1,481,600	8	1,751,600	5
Corvallis	6,983,028	86	6,548,300	86	5,796,400	85
Pendleton	1,472,905	20	1,424,500	20	1,694,500	20
Total	9,365,618	111	9,451,400	114	9,242,500	110
PENNSYLVANIA						
University Park	3,261,893	41	4,543,300	48	5,083,300	49
Wyndmoor	24,689,450	218	25,671,200	225	28,416,200	229
Total	27,951,343	259	30,214,500	273	33,499,500	278
SOUTH CAROLINA						
Charleston	2,652,185	34	2,565,400	34	3,130,600	35
Clemson	1,872,872	28	1,967,200	28	1,967,200	28
Florence	2,181,118	27	2,113,800	28	2,383,800	28
Total	6,706,175	89	6,646,400	90	7,481,600	91
SOUTH DAKOTA						
Brookings	3,041,007	25	1,746,900	25	1,746,900	25

AGRICULTURAL RESEARCH SERVICE
GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

Location	1999 Amount	1999 Staff Years	2000 Amount	2000 Staff Years	2001 Amount	2001 Staff Years
TEXAS						
Beaumont	1,365,392	14	1,332,000	14	1,332,000	14
Bushland	2,262,774	35	2,527,600	37	2,887,600	38
College Station	14,319,679	143	13,841,400	146	14,651,400	148
Houston	11,255,365	10	11,582,500	10	14,290,000	10
Kerrville	2,592,731	42	2,651,000	42	2,651,000	42
Lubbock	4,789,909	65	5,315,300	69	4,558,600	65
Temple	3,158,094	43	3,100,000	43	4,697,500	45
Weslaco	8,123,365	106	8,536,800	108	8,806,800	108
Total	47,867,309	458	48,886,600	469	53,874,900	470
UTAH, Logan	4,854,019	48	5,046,300	50	5,046,300	50
WASHINGTON						
Prosser	2,694,264	29	2,645,100	30	2,453,900	29
Pullman	9,370,122	98	10,287,700	105	10,038,600	100
Wenatchee	1,378,271	24	1,374,000	24	1,374,000	24
Yakima	3,943,816	77	2,876,900	78	2,955,600	77
Total	17,386,473	228	17,183,700	237	16,822,100	230
WEST VIRGINIA						
Beaver	4,567,011	58	5,221,600	62	4,726,600	58
Kearneysville	5,141,648	60	5,360,100	61	5,360,100	61
Leetown	2,569,253	3	2,994,400	10	2,420,600	10
Total	12,277,912	121	13,576,100	133	12,507,300	129
WISCONSIN, Madison	6,900,233	63	6,597,500	64	7,594,300	67
WYOMING						
Cheyenne	1,970,194	23	1,649,500	24	1,919,500	24
Laramie	2,932,535	26	2,431,800	28	2,431,800	28
Total	4,902,729	49	4,081,300	52	4,351,300	52
PUERTO RICO						
Mayaguez	2,284,432	35	2,427,900	35	2,351,400	35
OTHER COUNTRIES						
Argentina,						
Buenos Aires	505,713	--	461,800	--	461,800	--

AGRICULTURAL RESEARCH SERVICE
GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

Location	1999 Amount	1999 Staff Years	2000 Amount	2000 Staff Years	2001 Amount	2001 Staff Years
OTHER COUNTRIES (CONTINUED)						
France, Montpellier	2,196,616	3	1,945,400	3	2,215,400	3
Panama,						
Panama City	846,147	5	896,800	5	896,800	5
Total	3,548,476	8	3,304,000	8	3,574,000	8
Extramural and Funds Administered from Headquarters-Held Funds	14,344,937	--	39,629,500	--	55,420,800	--
Contingency Research Fund	a)	--	--	--	--	--
Repair & Maintenance of Facilities	18,257,765	--	18,262,400	--	18,262,400	--
Unobligated Balance	3,498,834	--	--	--	--	--
Subtotal, Available or Estimate	792,681,000	7,545	830,384,000	7,762	885,758,000	7,762
Transfer from Office of Congressional Relations	(129,000)	--	--	--	--	--
Transfer from Agency for Int'l. Development (AID)	(2,000,000)	--	--	--	--	--
Transfer from the Office of National Drug Control (ONDCP) for Anti-Drug Research and Related Matters	(23,000,000)	--	--	--	--	--
Emergency Supplemental Appropriations for Counter Drug Research and Development	(4,500,000)	--	--	--	--	--
Rescission	22,466,000	--	3,938,000	--	--	--
Pay Costs	--	--	--	--	8,500,000	--
TOTAL, Appropriation	785,518,000	7,545	834,322,000	7,762	894,258,000	7,762

a) Obligations incurred in 1999 under the Contingency Research Fund in the amount of $928,523 are reflected in the amount for recipient locations.

AGRICULTURAL RESEARCH SERVICE
STATUS OF PROGRAM

ARS finances and conducts research under seven major program activities: Soil, Water, and Air Sciences; Plant Sciences; Animal Sciences; Commodity Conversion and Delivery; Human Nutrition; Integration of Agricultural Systems; and Agricultural Information and Library Services. The research carried out under these program activities is explained in the "Purpose Statement" section of the Explanatory Notes. The selected examples of recent progress are listed by REE (Research, Education, and Economics) and ARS Strategic Planning goals.

Current program activities and progress under each research area are outlined below:

REE Goal 1--Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Current Activities

ARS conducts research designed to generate new knowledge; improve production systems; enhance resource efficiencies; improve the processing quality, performance, and value of commodities; and develop technologies to reduce pathogen risks that constitute nontariff agricultural trade barriers. With ARS research, the national needs for scientific agricultural information are met in a timely manner to provide U.S. agricultural producers and processors with access to current knowledge and technologies. Because trade issues are global, ARS collaborates with foreign research institutions. The outcomes are technologies and practices that reduce pathogen risks and encourage trade in agricultural products and mitigate nontariff barriers.

ARS research accomplishments strengthen the competitiveness of U.S. agriculture in domestic and export markets by improving the quality, value, and marketability of U.S. agricultural commodities. The accomplishments include a test for detection of Johne's disease, new technology for control of diamondback moths and cabbage loopers, sulfuryl floride as an alternative to methyl bromide fumigation of walnuts, new information on anticancer properties of orange peels, new methods for detecting sticky cotton, development of a vaccine for streptococcal infection in tilapia and hybrid stripped bass, and a new method for assessing beta glucan in oat flour.

Selected Examples of Recent Progress

An improved selection tool for dairy producers. Genetic selection has previously not considered economic factors. New indices predict the economic impact of genetic selection in dairy cows that produce for markets with various pricing formulas. Incomes, feed costs, longevity, and mastitis resistance were combined and factored in the prices used in fluid and cheese markets. With implementation of the new indices in February 1999, dairy producers are now able to base their breeding decisions on information that use the net price formulas closest to the price expected in about five years when offspring from current matings would be lactating. This also enables suppliers of seed stock to select for long term national or global demands instead of short term local prices. (Animal Sciences)

A test has been developed that predicts fertility in male turkeys. Artificial insemination using a mix of semen from a number of toms is used to produce commercial turkeys. This practice, which is labor intensive, reduces the amount of genetic variability available for selecting superior sires. A sperm motility test developed by ARS scientists in Beltsville, Maryland which has been evaluated by the turkey industry, predicts fertility under on-farm conditions. This finding will be used to eliminate low fertility males from the breeding stock. (Animal Sciences)

A test for detection of Johne's disease. Johne's disease is a chronic infectious and contagious bacterial disease of ruminants caused by *Mycobacterium paratuberculosis*. Economic losses to the U.S. dairy industry are estimated anually at $200 per infected cow. Prevalence of the disease may be as high as 30 to 45 percent. Scientists at Ames, Iowa have developed a simple DNA-based test for this bacteria, which will reduce detection time in herds to two days instead of the several weeks it takes with traditional culture. This new test is sensitive enough to detect subclinical infections, which is not the case with the serologic tests now widely used. (Animal Sciences)

Dogs are a reservoir for *Neospora caninum*. The number one cause of abortions in dairy cattle in California is now attributed to infections with *Neospora caninum*. Scientists at Beltsville, Maryland have demonstrated that dogs are a reservoir for this parasite which results in costly calf losses throughout the world. This information is a key element to understanding the life cycle of this parasite, and provides an immediate means to break the cycle of infection in cattle with neosporosis. (Animal Sciences)

Cloning and sequencing of the newly emerged Taiwanese foot-and-mouth disease virus. An outbreak of foot-and-mouth disease in 1997 in Taiwan cost more than $5 million in economic losses, and the death of over six million swine. Scientists at Plum Island, New York demonstrated that the Taiwan virus had a specific gene deletion that resulted in the virus no longer being infectious to cattle. These studies will help scientists understand how and why the new foot-and-mouth virus emerged and will lead to better ways of preventing emergence of new variants of viruses. (Animal Sciences)

Transgenic corn for optimal swine feeding. Swine are fed a substantial proportion of the U. S. corn crop, but nutrient supplements are necessary for an optimal diet. ARS researchers at Ames, Iowa have produced transgenic corn with genes for a key protein in sows' milk, and a protein with potent antimicrobial properties. This may enable production of corn that is nutritionally-superior for swine feeding. Because of its antimicrobial properties, it also may eliminate the need for extensive doses of tetracycline antibiotics. As a result, swine production would be more cost efficient. (Plant Sciences)

Downey mildew resistance transferred from wild sunflowers. Downey mildew is an important disease of sunflowers that has been controlled by a chemical. Recently, the most commonly used chemical has lost its effectiveness. ARS scientists at Fargo, North Dakota have developed an interspecific germplasm line by transferring downey mildew disease resistance genes from a wild annual ancestor into cultivated sunflowers. This germplasm line offers industry the opportunity to transfer resistance into cultivated sunflowers. (Plant Sciences)

Diet for mass rearing of insect predators. Augmentation biological control is a promising alternative to pesticides for insect management. However, the augmentation approach requires rearing of natural enemies that possess a high level of fitness. The principal obstacle is lack of a suitable, inexpensive insect diet. Based on feeding mechanisms of lygus bugs and their predators, researchers at the Biological Control and Mass Rearing Research Laboratory in Starkville, Mississippi have developed an inexpensive insect diet. A patent has been filed that covers a solid to liquid diet for insects that eat other insects. This diet will likely attract the attention of the expanding biological control products industry. (Plant Sciences)

Improved biological control agent for fire blight identified. Fire blight, a bacterial disease of apples and pears, causes serious production losses each year. It has become increasingly important as more susceptible fruit varieties are planted and existing fire blight bacteria become more resistant to the antibiotic commonly used to control the disease. Scientists in Wenatchee, Washington, using a novel technique to produce crab apple blossoms year round, were able to isolate another species of bacterium that is antagonistic to the fire blight organism and significantly better at controlling the disease than currently available biological agents. Using this new strain will allow fruit producers to better manage the fire blight disease and reduce losses in apple and pear orchards. (Plant Sciences)

Fungi causing karnal bunt of wheat and a ryegrass disease shown to be a different species. Fungal spores

similar to those causing the karnal bunt disease were found on wheat in the Southeastern U.S. threatening production and exports. Scientists at Beltsville, Maryland conclusively showed that the two fungi were morphologically and genetically different and developed tests to distinguish them. The new fungus turned out to infect ryegrass commonly found in wheat fields. These findings help to maintain the large ($4 to $5 billion) U.S. wheat export market. (Plant Sciences)

Male-specific semiochemicals for Asian longhorned beetle synthesized. The recent Asian longhorned beetle threat to U.S. forests has cost $5.2 million for eradication efforts. Detection and trapping devices are urgently needed as a first line of defense. ARS scientists at Beltsville, Maryland have discovered, identified, and synthesized male-specific compounds that may help attract insects to one another for reproduction. The biological role of the male-specific odorants are not yet known. Research is continuing to determine the role of the volatile substances, identify the sex attractant of beetle females, and design an effective trap for this pest. (Plant Sciences)

Mating disruption technology for control of the diamondback moth and cabbage looper. The Food Quality Protection Act of 1996 puts many of the chemical pesticides currently used for insect pests of cole crops at risk. The loss of these and other insecticides, along with a lack of suitable substitutes, threaten the continued economic existence of many small and medium farms. ARS scientists at Gainesville, Florida have developed a highly effective mating disruption system that conserves natural enemies for control of the diamondback moth and cabbage looper in Florida's cole crops, especially cabbage. Pheromone treated fields generally required 80 percent fewer insecticide applications compared to conventional control practices. This technology has also been used successfully to control beet armyworm in cotton. It is being commercialized by the Shin-Etsu Chemical Company and United Agri-Products. (Plant Sciences)

Areawide pest management program for codling moth successfully completes its final year. The western region of the Nation includes 54 percent of U.S. apple production acres and 97 percent of pear production. The codling moth is the key pest of pears and apples in that area. Traditional pest control methods, chiefly multiple sprays with organophosphate insecticides, which are at-risk pesticides, have led to the development of resistant strains of codling moth, reduced populations of beneficial insects, increased secondary pest outbreaks, and increased concerns over farm worker safety. ARS scientists at Wapato, Washington have led an areawide management partnership program since 1995 across the three State area of Washington, Oregon, and California using mating disruption, sanitation, natural enemies, and early season Bt sprays. Since the beginning of the program, organophosphate insecticide use has significantly declined with some orchard growers not having sprayed for codling moth or other orchard pests in two years. In 1995, there were 68 growers and 3,109 acres (five sites) in the program. In 1999, more than 600 growers and 21,000 acres (22 sites) had entered the program. The technology has now been accepted by growers across the region. In Washington State alone, the number of acres within and outside the program has increased from 24,000 in 1997 to more than 60,000 in 1999. (Plant Sciences)

Gene for cold tolerance in rice identified. Production of rice, a staple food worldwide, is constrained by pests, pathogens, and environmental extremes. Lack of cold tolerance in tropically adapted rice has impeded efforts to boost production and to move tropical germplasm into higher latitudes in the U. S. and elsewhere. Using molecular markers, ARS researchers at Davis, California have identified a gene on a specific rice chromosome that apparently controls cold tolerance. This gene may help rice breeders improve cold tolerance in tropical rice varieties. (Plant Sciences)

Mechanism of action of leptin. Feed is the single largest cost in livestock production. The hormone, leptin, is known to reduce feed intake of swine and causes a loss of body fat, but conserves muscle protein. Scientists in the Growth Biology Laboratory in Beltsville, Maryland have demonstrated that leptin reduces energy use by adipose tissue of swine, and simultaneously reduces muscle protein breakdown which enhances muscle energy utilization. Reducing protein breakdown rates in muscle is a potential way to enhance production efficiency of growing animals. (Animal Sciences)

Catfish fingerlings fed daily in mixed cultures have higher production. Catfish cultured in commercial ponds are often fed every other day during extremely hot weather, however, fewer feeding days can result in lower yields and economic returns. Scientists at the ARS Aquaculture Systems Research Unit in Pine Bluff, Arkansas compared production of mixed size groups of channel catfish fed daily with those fed every other day when pond water temperatures were 90 Fahrenheit or higher. Results showed that fingerlings fed every day had higher survival rates, grew 70 percent larger, and had 23 percent greater net production than fingerlings fed every other day. Based on these results, every day feeding even during extremely hot weather will result in higher production efficiency and profits. (Animal Sciences)

Vaccine developed for streptococcal infection in tilapia and hybrid striped bass. Hybrid striped bass and tilapia production are significantly affected by *Streptococcus iniae* infection, annually costing $150 million worldwide and $50 million in the U.S. Scientists at the ARS Fish Diseases and Parasites Laboratory in Auburn, Alabama have formulated a vaccine against streptococcus infection. Preliminary vaccine trials have indicated the vaccine is effective in prevention of infection in tilapia and hybrid striped bass. A CRADA is pending to manufacture and market the vaccine, and improve formulations and vaccine delivery methods. Use of the vaccine in a commercial culture could improve profitability by reducing economic losses from disease and the need for antibiotics. (Animal Sciences)

Lysine demonstrated to be inhibitor of off flavor producing blue-green algae. Current production practices in channel catfish culture systems promote production of problem algae that can create instances of low oxygen levels and production of undesirable taste/odor compounds. Scientists in the ARS Food Processing and Sensory Quality Laboratory at the Southern Regional Research Center in New Orleans have demonstrated that lysine, an abundant naturally occurring compound, was a potent inhibitor of off flavor caused by blue-green algae in laboratory studies. Results indicate this compound could be used as a new tool to reduce problem algae and off flavor in catfish production. Further tests are being conducted on the effectiveness and economic feasibility of using lysine to control algae in catfish ponds. (Animal Sciences)

Orexin-B increased feed intake in piglets. Neonatal mortality and poor growth of surviving piglets are important causes of economic loss in the swine industry. Improving survival by one piglet per liter is worth about $400 million per year to the industry. Feed intake is a critical aspect of the biology of survival, growth, and stress control. ARS scientists at Columbia, Missouri, in collaboration with the University of Missouri scientists demonstrated that Orexin-B injections increased feed intake in piglets. Application of this knowledge to reduce stress at weaning time to improve production efficiency of pigs is underway. (Animal Sciences)

New vaccine prevents fescue toxicosis resulting in cost savings for beef producers. Most of the 35 million acres of tall fescue used for grazing in the United States are infected with a fungus that increases plant viability and productivity, but produces compounds that have a negative impact on animal production, which is estimated to cost beef producers $600 million annually. ARS researchers in Athens, Georgia, in cooperation with the University of Georgia, have obtained three patents (two in the U.S. and one in New Zealand) for a vaccine developed to prevent fescue toxicosis of cattle. This research will ultimately give producers an option to retain productive endophyte-infected tall fescue without sacrificing animal productivity. (Animal Sciences)

Sulfuryl floride as an alternative to methyl bromide fumigation for in-shell walnuts. Walnuts must be vacuum fumigated with methyl bromide in order for them to enter the European Union market. Tests have determined that sulfuryl floride can replace methyl bromide, a fumigant that will be banned in 2005 by the Montreal Protocol because of damage to the stratospheric ozone layer. These tests will provide an incentive to the maker of sulfuryl floride to register the material for use on walnuts. It potentially will have a major impact on the U.S. walnut industry by keeping open the lucrative European market after the prohibition of methyl bromide. (Commodity Conversion and Delivery)

New rice products and processes. To remain competitive in today's global markets, the U.S. rice industry must capture the entire value of the kernel through the development of value added products from the bran and broken kernels and reduced cooking time for rice to improve consumer convenience. ARS scientists at the

Southern Regional Research Center in New Orleans have developed rice protein isolates by enzymatic treatment of protein enriched flours, a co-product from manufacturing rice syrups, and rice fries which using rice flour and defatted rice bran contain 25 to 50 percent less fat than conventional potato fries. They have also invented a process for reducing cooking times for brown and wild rices from 45 to 50 minutes to 20 minutes, the same as white rice. A manufacturer is preparing a pilot plant facility for scale-up production of the isolate which, due to the hypoallergenicity of rice protein, is particularly desirable for infant formulas and foods. A Cooperative Research and Development Agreement (CRADA) is in place to commercialize rice fries, and CRADAs are being negotiated with major rice and wild rice milling companies to adapt the reduced cooking time technology. (Commodity Conversion and Delivery)

Fantesk starch-oil composites. Starch and vegetable oils (e.g., those derived from corn and soybeans) are biodegradable, nontoxic materials produced by American agriculture in billion pound quantities annually. Fantesk, a stable microemulsified composite of oil in a starch-water matrix developed by scientists at the National Center for Agricultural Utilization Research in Peoria, Illinois has both food and nonfood applications. One licensee of this technology is now marketing a seed coating formulation to inhibit water uptake by seeds during cold weather planting. A CRADA partner is testing another formulation in oil well drilling muds; another one is testing formulations in moisturizing lotions and barrier creams. A Fantesk-based low fat soft serve frozen desert product has been developed and demonstrated at a major national food technology conference. (Commodity Conversion and Delivery)

Development of a modified divider for automated grading of peanuts. Contamination from foreign materials and aflatoxin poses major limitations to profitable peanut production by U.S. farmers. Development of new equipment for cleaning and grading can improve peanut quality and profitability. ARS scientists at the National Peanut Research Laboratory in Dawson, Georgia have developed and successfully tested an automated divider for use in grading farmers' stock peanuts which is now being manufactured and sold. (Commodity Conversion and Delivery)

New method developed for early screening and detection of sticky cotton. When a cotton crop is contaminated by honeydew from aphids or whiteflies, the lint becomes "sticky," and adheres to processing machinery forcing the cotton mill to be shut down for cleaning. A routine, reliable, inexpensive test of stickiness is needed before the cotton enters the mill. ARS researchers at Clemson, South Carolina have identified a procedure based on near infra-red spectroscopy to detect insect produced sugars that cause stickiness. This method has now been calibrated against other absolute measurements of sugars and is ready to be evaluated as a screening technique on field grown cotton as a basis for developing processing guidelines. Early identification of sticky cotton can save the average cotton mill $1.2 million per year in maintenance costs. (Commodity Conversion and Delivery)

"Smart" wound dressings of cotton. Cotton has long been used for woven bandages, but the cotton has had no special healing properties. Now, new cotton treatments developed by ARS researchers in New Orleans make the cotton selectively and irreversibly absorb elastase, a destructive protease enzyme found in nonhealing wounds (such as bedsores). The "smart" dressings, which are being clinically evaluated for their wound healing properties, have the potential not only to create a new market for value added cotton products, but to alleviate much human suffering. (Commodity Conversion and Delivery)

New microorganisms improve ethanol production. To reduce dependence on imported oil, ethanol and other biofuels must replace petroleum-based fuels. A major constraint to converting biomass to ethanol is the need for microorganisms that can ferment the mixed sugars obtained from the hydrolysis of cellulose and hemicellulose. A team of researchers from the National Center for Agricultural Utilization Research in Peoria has developed a strategy for creating ethanol producing microorganisms with enhanced genetic stability and high ethanol yields. This approach, for which a patent has been applied, is expected to boost ethanol yields from corn by over 10 percent. At present processing levels, this will increase net returns to the ethanol industry by $33 million. (Commodity Conversion and Delivery)

Compounds with anticancer properties from orange peels. Citrus is the largest fruit crop in the United States. The U.S. industry faces serious economic pressures from citrus juice plants in Brazil and several other developing countries that have the advantages of lower labor costs and fewer regulations. Compounds, called flavonoids, were extracted from citrus processing waste by researchers in Winter Haven, Florida and submitted to the National Cancer Institute for evaluation of its anticancer properties. Based upon these evaluations, three invention disclosures relating to the anticancer actions of these flavonoids were submitted. The discoveries will promote citrus consumption and add value to some citrus pulp and peel byproducts. (Commodity Conversion and Delivery)

Soy oil-based inks. The markets for the sheetfed and heatset inks exceed 100 million pounds and 400 million pounds per year, respectively. EPA, the Clean Air Act Amendment, and OSHA regulations exert an ever growing pressure on the graphic arts industry to limit the use of organic solvents, create less toxic waste, use renewable resources, and produce more biodegradable products. Scientists at the National Center for Agricultural Utilization Research in Peoria have responded by developing and patenting formulations for sheetfed and heatset inks consisting of pigments and 100 percent soybean oil. Formulations have been modified to satisfy the need of different companies and applications for licensing them are underway. These products will provide more environmentally friendly inks and open new markets for vegetable oils. (Commodity Conversion and Delivery)

New convenient method developed for assessing beta glucan content of oat flour. Beta glucan (soluble fiber) in oat flour tends to lower serum cholesterol of humans and can be an important part of a healthful diet. ARS researchers in Fargo, North Dakota have established that the beta glucan content of oat flour can be easily estimated from the viscosity of an oat flour slurry. This information was developed into a simple and inexpensive test for beta-glucan. The test is being used in the private sector to develop a beta-glucan diet supplement. It is also being used to optimize the enrichment of beta glucans in oat bran during dry milling. These results provide a tool to make oat processing more efficient and reliable. (Commodity Conversion and Delivery)

REE Goal 2 - To ensure an adequate food supply and improved detection, surveillance, prevention, and educational programs for the American public's health, safety and well-being.

Current Activities

ARS conducts research to ensure a secure agricultural production system that reduces or eliminates factors that threaten the ability of U.S. agriculture to produce sufficient food to meet the needs of consumers. ARS' research is designed to generate knowledge regarding new and improved management practices, pest management strategies, sustainable production systems, and control of potential contaminants. Food safety research seeks ways to assess and control potentially harmful food contaminants.

ARS' research accomplishments increase food safety and help ensure a plentiful and affordable supply of food. The accomplishments include improved methods for detecting E. coli and Salmonella, improved strategies for controlling aflatoxin, new information on controlling Listeria, a new system to classify meat tenderness, new technology to detect potato late blight, and development of an experimental model for tuberculosis in animals.

Selected Examples of Recent Progress

Quick method for predicting bread dough mixing strength. Dough mixing is the first processing step in bread making and dough mixing strength is an important index of quality. ARS scientists in Manhattan, Kansas have developed a quick method to predict dough mixing strength by measuring the amount of insoluble polymeric proteins in wheat flour. The method can differentiate stronger dough (having larger amounts of polymeric proteins) which produce better breads from weaker dough which result in poor quality. This method will enhance the screening procedure for the wheat breeding program. (Commodity Conversion and Delivery)

Machine harvest of blackberries. The high cost of harvest labor has prevented extensive plantings of blackberries for the packaged fresh fruit market. As a result, most fresh blackberries are imported from Central America. ARS researchers in Kearneysville, West Virginia have devised new cane management practices using a rotatable cross arm trellis that permits machine harvesting of blackberries with fresh market quality. The new trellis and cane training systems have been found by bramble growers to have great potential for you pick and hand picked fresh market fruit sales. The development of cultural systems compatible with mechanical harvesting for the fresh fruit market will lead to expansion of the domestic blackberry industry. (Commodity Conversion and Delivery)

Methyl iodide, sulfuryl floride, and carbonyl sulfide, tested as alternative fumigants for methyl bromide for use on dried fruits and nuts. The primary fumigant used for dried fruit and nuts is methyl bromide. Another chemical, methyl iodide, provides insect control with fumigation times and chemical doses comparable to methyl bromide. Other chemicals, while not as effective as methyl bromide, provide acceptable performance in specific situations. None of these chemicals are presently registered for use on dried fruits and nuts, but this research by ARS scientists at the Horticultural Crops Research Laboratory in Fresno, California provides efficacy data which should encourage the manufacturers of these chemicals to register them. (Commodity Conversion and Delivery)

Catfish gene associated with disease resistance cloned and sequenced. Bacterial diseases account for the majority of losses in commercial channel catfish culture. Scientists in the ARS Catfish Genetics Research Unit at the National Warmwater Aquaculture Center in Stoneville, Mississippi and the University of Mississippi College of Veterinary Medicine cloned and sequenced the catfish gene encoding the natural resistance associated macrophage protein (nRAMP). The DNA sequence of the catfish nRAMP gene, known to be associated with disease resistance, was similar to nRAMP genes in other animal species. Expression of the catfish nRAMP gene was also increased by stimulation with bacterial cell components, which suggests a role for the gene in the catfish immune system. Scientists are continuing to determine if this gene can be used as a genetic marker in the applied breeding program to select for disease resistant catfish. (Animal Sciences)

Corn that resists aflatoxin formation in the Midsouth. Aflatoxin caused by the fungus *Aspergillus flavus* is a carcinogenic toxin that can accumulate in infected corn, peanuts, and many other oilseed crops. In 1998, aflatoxin destroyed the value of virtually the entire corn crop in the South. This year, ARS researchers released Mp715, a new corn germplasm line with the highest level of resistance to aflatoxin currently available. It will provide a new source of genes for breeders developing aflatoxin resistant hybrids for commercial planting. (Plant Sciences)

Potato late blight detection improved. Accurate forecasting of potato late blight requires identificaton of potential inoculum sources of the fungus. A method has been developed by ARS scientists in Beltsville, Maryland that uses DNA technology to accurately identify the pathogen in latent infections (those with no symptoms). Detection of latent infections of potatoes in storage will lead to better forecasting of disease occurrence in the field, and reduce use of fungicides. (Plant Sciences)

Development of soybean variety with oil properties that do not require hydrogenation. Soybean oil is often hydrogenated to improve stability, but this produces trans fatty acids with implications for cardiovascular disease. ARS scientists at Raleigh, North Carolina have developed a new low linolenic soybean variety that does not produce oil requiring hydrogenation. This development provides processors with soybean oil that has better flavor, improved stability when used in frying, and no trans fatty acids. This is the first public release of a low linolenic soybean for the Southeastern U.S. (Plant Sciences)

Development of an experimental model for tuberculosis disease transmission. Tuberculosis is a chronic debilitating disease of animals and humans that is now emerging as an important wildlife disease. In Michigan, tuberculosis in deer has resulted in transmission to dairy cattle and the loss of the State's certified free status. Scientists at Ames, Iowa have developed an experimental model of tuberculosis in white-tailed deer, which

will allow them to study the transmission of the bacterial pathogen between deer and cattle. Using this information, new disease management strategies can be devised. (Animal Sciences)

Genetic linkage maps have been used to identify locations on chromosomes of genes that affect production traits. The profitability and global competitiveness of animal agriculture can be improved by increasing production efficiency. Comprehensive genetic linkage maps for cattle, swine, and chickens were developed several years ago by ARS and other scientists. ARS scientists at Clay Center, Nebraska and East Lansing, Michigan have now identified five chromosome regions that influence muscling and growth in cattle, two chromosome regions that affect puberty, five that affect ovulation rate, one that affects uterine capacity of swine, and 14 regions that affect resistance to Marek's disease. Marek's disease is of particular concern to the poultry industry because vaccination is becoming less effective in controlling the disease. Bovine, porcine, and avian chromosomal regions will be evaluated to improve genetic trait selection and production efficiency. (Animal Sciences)

Marker strains of *Aspergillus flavus* facilitate crop resistance determination. Aflatoxins are natural poisons produced by two common fungi, *Aspergillus flavus* and *Aspergillus parasiticus*. These fungi invade crops such as corn, peanuts, cotton and treenuts which produce aflatoxins, making the crops unfit for sale under existing regulatory guidelines. ARS scientists have developed marker strains of *A. parasiticus* to monitor the progression of aflatoxigenic fungi during invasion of corn and cotton and their ability to make toxin. These marker strains of the fungus allow rapid screening of the germplasm of affected crops, to determine resistance to fungal invasion and toxin formation. (Plant Sciences)

A system to classify meat tenderness predicts tenderness in beef cuts. A decline in consumer preference for red meat has been attributed in part to inconsistent quality, particularly tenderness. The MARC Beef Classification System enables the industry to market beef based on tenderness, thereby improving consumer satisfaction. The Beef Classification System was developed by ARS scientists in Clay Center, Nebraska in cooperation with the National Cattlemen's Beef Association and two supermarket chains. This system was also used to classify ribeye steaks and three other cuts. The beef carcass tenderness classification based on ribeye tenderness can also accurately segregate other cuts into different tenderness groups. This finding will increase the number of beef cuts that can be marketed as superior in tenderness and reduce the cost of applying the tenderness classification by spreading it over a greater number of beef cuts. (Commodity Conversion and Delivery)

Rapid detection of antibiotic resistant Salmonella. Rapid methods are needed to identify multi-drug antibiotic resistant bacteria, such as, *Salmonella typhimurium* DT104 in food producing animals and their environment. ARS determined that resistance to the antibiotics florfenical and chloramphincol are conferred by the *flo* gene. Presumptive identification of this multi-resistance can now be made rapidly based on the presence of the gene and its resulting phenotype. This information will enhance the development of a test kit to rapidly identify DT104 and slow its spread to food products. (Animal Sciences)

Using competitive exclusion for pathogens in swine. Salmonella and other enteropathogens carried by swine presented for slaughter can contaminate meat intended for human food. A competitive exclusion culture of nonpathogenic bacteria was developed to control Salmonella in swine. This culture given to neonatal pigs reduced mortality in baby and weaned pigs, and significantly reduced mortality associated with pathogenic E. coli in very early weaned pigs challenged with the pathogens. The individual bacteria species have been isolated and a recombined culture has been developed that has the same efficacy as the original culture. Specific identification of the bacterial components of such cultures is necessary for reproducing the results and FDA approval. (Animal Sciences)

Broiler transportation. In order to decrease cross contamination of poultry with pathogens, studies compared conventional solid flooring to elevated wire mesh during transport and holding of broilers prior to slaughter. Results indicated that although broilers transported and held on solid flooring had noticeably dirtier breast feathers and higher coliform and E. coli counts prior to scalding and defeathering, bacteria recovery from

external carcass rinses did not differ between the solid and wire flooring treatments after defeathering. The processing steps of immersion scalding and defeathering consistently lowered carcass bacteria counts and the incidence of Campylobacter-positive, but not Salmonella-positive carcasses. (Commodity Conversion and Delivery)

Cold shock sensitizes pathogens in fruit juices. The contamination of fruit juices by bacterial pathogens is of considerable concern to regulators and industry. The FDA now requires processing strategies for apple cider production that effectively give a 100,000 fold reduction in bacterial contamination. ARS research showed that a sensitizing cold treatment prior to thermal processing increased the effectiveness of the thermal process for the destruction of Listeria monocytogenes, *E. coli* O157:H7, and *S. typhimurium* in juices. The inducible and enhanced vulnerability to heat in model and food systems shows potential for use by the food industry as a practical and efficacious postprocessing intervention strategy to eliminate these bacterial pathogens. Cold shock treatment prior to pasteurization of fruit juices could provide an extra measure of safety and would allow juice processors to reduce thermal processing requirements for pathogen control while maintaining the fresh qualities of the juice. (Commodity Conversion and Delivery)

Heat resistance of listeria monocytogenes. Recently, there have been several serious outbreaks of human listeriosis due to the consumption of contaminated hot dogs and processed meats. In order to determine the most effective method for thermal processing of prepackaged meat products, studies were performed to determine the heat treatment required to kill listeria monocytogenes. The data was used to develop a mathematical model for determining the effects of environmental parameters on thermal resistance of the bacterium. Using this predictive model, food processors should be able to design thermal processes for the production of safe food with extended shelf life without substantially adversely affecting the quality of the product. (Commodity Conversion and Delivery)

New method for detecting E. coli in ground beef. There have been numerous outbreaks of E. coli associated foodborne illnesses from consumption of contaminated ground beef. In order to rapidly detect contaminated product, ARS developed a sensitive, highly specific, cost efficient test that requires minimal culture enrichment for the detection of E. coli in beef hamburger patties. Antibody coated magnetic beads capture E. coli O157:H7 cells in meat product enrichment broths. A magnet devise is then used to capture the live cells which are concentrated to allow growth and detection on a special culture medium. The approach allows detection of E. coli O157:H7 at a level of ~1 CFU/g after a six hour enrichment. Samples can be collected from remote field locations away from central laboratories since the immobilized bacterial samples are stable for 48 hours at 4C without significant changes. (Commodity Conversion and Delivery)

Detection of dioxins. Identification of chlorinated dioxin residues (PCDDs) in animals raised for food is important in order to minimize economic losses and reduce food and related illnesses. ARS has developed a rapid, inexpensive immunoaffinity column (IAC) clean up method for the detection of polychlorinated dibenzo-*p*-dioxins (PCDDs) and related compounds from serum samples. Studies showed that several of the most toxic PCDDs bound to the IAC, and the congeners could be readily removed before analysis by high resolution gas chromatography high resolution mass spectrometry. Addition of a prewashing step before applying the sample dramatically increased the recovery of 2,3,7,8-TCDD from 16 percent to 83 percent. Verification studies of samples provided by the CDC indicated that six dioxin and furan congeners were quantitated within the 95 percent confidence limits of the method at the part per quadrillion level. This technology will be of importance to regulatory agencies and other scientists for reducing the time and costs associated with dioxin analysis, which is presently $1000 per sample. (Commodity Conversion and Delivery)

Apple decontamination. Surface contamination of fruits and vegetables by bacterial pathogens is of considerable concern to regulators and industry. For example, the FDA now requires production and processing strategies for apple cider that effectively provide a 100,000 fold reduction in bacterial contamination. The efficacy of commercial brush washing equipment used in conjunction with conventional and experimental washing and sanitizing agents for surface decontamination apples was investigated in a commercial cider mill. Results indicated that brush washing in the presence or absence of washing and sanitizing agents did not

significantly reduce the bacterial population on apples or in cider. Cider contamination likely resulted from the inability of the washing systems to inactivate or remove microorganisms in inaccessible calyx and stem areas of apples. (Commodity Conversion and Delivery)

Decontamination of sprouts. Recently, there have been outbreaks of foodborne illness associated with the consumption of alfalfa sprouts. ARS was requested to conduct research on novel combination treatments for decontamination of alfalfa seeds, and several alternative treatments were developed. A combination of treatments using gamma irradiation followed by chemical sanitizing with two percent calcium hypochlorite yielded a 100,000 fold reduction in the population of Salmonella on inoculated seeds, a reduction level that could not be achieved with individual treatments alone. The efficacy of 20,000 parts per million chlorine for sanitizing seed contaminated with E. coli O157:H7 was confirmed. Data generated on the use of two percent calcium hypochlorite was used in support of a successful joint USDA/industry petition to the EPA to allow use of the agent for sanitizing seed destined for sprouting. This technology is now widely used in the U.S. sprouting industry. (Commodity Conversion and Delivery)

Utilizing tall larkspur without toxic effects. Larkspur is toxic to grazing cattle and causes serious losses to livestock producers in Western ranges. ARS research established that toxic alkaloid levels in tall larkspur vary between species, locations, and during the growing season. Alkaloids, however, appear to be synthesized in the first three to four weeks of growth followed by reduced concentrations as plants continue to grow throughout the season. Understanding such patterns will help to predict the potential toxicity of larkspur populations to susceptible grazing livestock. (Animal Sciences)

Identification of low dose effects of locoweed will aid decisions on range management. Locoweed is a major management problem for cattle ranchers since it causes abortion, weak calves at birth, and weight loss in the stocker-yearling herds. ARS research demonstrated that alkaline phosphatase and serum iron levels change very quickly (within 24 hours of initial exposure to swainsonine) and these changes occur prior to those in other cellular damage markers. This indicates that locoweed toxin alters cellular metabolism and nutrient utilization, and that it may occur before tissue damage or clinical signs are present. The information will help ranchers make more informed management decisions on utilization of ranges. (Animal Sciences)

Toxicity studies of fumonisins help to establish regulatory guidance. Several diseases of farm animals are caused by toxic metabolites produced by *Fusarium moniliforme* associated with major crops, particularly corn. The FDA is concerned about levels of the toxin, fumonisin B1, in grain and may issue regulatory guidance. ARS scientists directly contributed to the design and successful completion of chronic toxicity and carcinogenicity studies of fumonisin B1 in rats and mice, as well as teratology studies of the mycotoxin in rabbits and rats. These studies showed that fumonisin B1 is carcinogenic in rodents that fumonisin is not teratogenic, and provides target organ and dose response data. The data is critical for completion of FDA risk assessments to protect the public health. (Animal Sciences)

Disrupted fungal gene will help determine the toxin biosynthesis pathway. The fungus *Fusarium graminearum* which causes Fusarium head scab also produces the toxin deoxynivalenol (DON) that is harmful to humans and animals that consume toxin contaminated food or feed. ARS scientists have cloned the TRI101 gene from *Fusarium graminearum*, and by gene disruption, identified its role in DON biosynthesis and toxin resistance. Mutant strains with a disrupted TRI101 gene will be useful as tools to identify additional toxin resistance genes in Fusarium and to determine the DON biosynthesis pathway, thus leading to effective control strategies. (Plant Sciences)

Natural resistance to aflatoxin formation found in tulare walnuts. Contamination of tree nuts by aflatoxins produced by the fungi, *Aspergillus flavus* and *Aspergillus parasiticus*, is a serious problem because of the potential threat to human health and resulting stringent regulatory levels imposed for these toxins. The current U.S. guideline set by the FDA is 20 parts per billion total aflatoxins. The European Community, however, has instituted a standard of two parts per billion aflatoxin B1 and four parts per billion total aflatoxins. ARS research has demonstrated a significant difference in the ability of almonds and walnuts to support aflatoxin

production, and that significant varietal differences exist within each crop. In these studies, the tulare variety of walnuts was found to completely suppress aflatoxin production, which is the first example of a commercial variety of any susceptible crop plant that shows complete resistance to aflatoxin. This information suggests that selections of tree nut breeding lines for aflatoxin resistance can be effectively made. (Plant Sciences)

REE Goal 3 - A healthy and well nourished population who have knowledge, desire, and means to make health promoting choices.

Current Activities

ARS conducts human nutrition research that establishes the relationship between diet and health, measures food consumption patterns, and develops new methods to measure the nutrient composition of food. The outcomes of these efforts are a safe and nutritious food supply, and a knowledge base that enables humans to make healthful food choices.

ARS' research accomplishments lead ultimately to a reduction in the incidence of nutritionally-related diseases and to a more healthy and productive population. The current accomplishments include findings that may influence the incidence of breast and colon cancer, osteoporosis, vascular diseases, insulin dependent diabetes, and memory loss.

Selected Examples of Recent Progress

Nutritional status at a very early age may have a major impact on cognition and brain function. Researchers at the Arkansas Children's Nutrition Center have shown that children who were suspected of nutrition deficits as infants exhibit a greater range of emotions on temperament scales, and have lower plasma ferritin, calcium, sodium, and magnesium levels. When these children become older, the data suggest that they are deficient in academic skills, i.e., symbol search, IQ, reading, arithmetic, and longer latencies on the right side of their brains than on the left side for tasks which compare the recognition of congruent works with anomalous letters (pattern recognition). This can translate into skill deficiencies, such as language acquisition. (Human Nutrition)

Factors in soy protein isolate may reduce the incidence of breast and colon cancer in animal models. Studies conducted at the Arkansas Children's Nutrition Center suggest that soy protein isolate, the sole protein source of most soy infant formulas, can reduce the incidence of breast cancer and colon cancer, and improve metabolism. Rats used in the research had leaner body composition, greater metabolic capacity towards xenobiotics, such as medications and carcinogens, 25 percent lower risk of developing chemically induced breast cancer, and 80 percent lower risk of developing chemically induced colon cancer. Similarly, a modified version of the common whey protein found in milk can also provide even more protection against breast cancer and also protect against colon cancer in rats. This knowledge will be useful in designing studies on human diets to improve health longevity. (Human Nutrition)

Requirement for dietary choline is partly dependent on the folate intake. Choline is a nutrient that is needed for growth of healthy cells and production of the neurotransmitter, acetylcholine. Choline can substitute for folate in some biochemical reactions. The body can make its own choline, but studies at the Western Human Nutrition Research Center in Davis, California have shown that the body could not make enough choline when dietary folate and choline intakes were low, probably because choline was being used to make up for the lack of folate in the diet. This has been shown in postmenopausal women, and similar results have been found in adult men. These data contributed to recent decisions to double the RDA for folate from 200 to 400 micrograms per day and to recommend for the first time an Adequate Intake for choline of 425 and 550 milligrams per day for women and men, respectively. The findings also raise the question of whether the dietary requirement for folate may depend on choline intake. This has potentially great significance since the recent doubling of the folate RDA and the mandate to fortify U.S. grain products with folic acid stems from

the newly recognized roles of folate in preventing neural tube birth defects and elevated blood homocysteine levels (a risk factor for heart disease). The body's folate status may depend not only on how much folate but how much choline is consumed. (Human Nutrition)

Dieters may experience a more efficient return to the resting metabolic state following periods of activity. There is considerable controversy surrounding the claim that dieting results in a drop in metabolic rate, which in turn contributes to difficulty in sustaining weight loss. Investigators at the Western Human Nutrition Research Center have found that a brief dieting period of three days was not associated with a significant decrease in metabolic rate in the basal state, but it did lead to decreased metabolic rate in the first hour during recovery from moderate intensity exercise. This phenomenon may contribute to the conservation of energy during periods of restricted energy intake. (Human Nutrition)

Less toxicological risk from selenium found in broccoli. Broccoli may contain a unique and beneficial form of selenium but little is known about its metabolism. Researchers at Grand Forks Human Nutrition Research Center conducted a study to determine the effectiveness of high selenium broccoli in restoring tissue selenium concentrations and selenoprotein activities. Studies using rats showed that selenium from broccoli accumulated slower and did not increase selenoprotein enzyme activity as much as other forms of selenium. Because these studies indicated that the selenium from broccoli may not pose as much of a toxicological risk as other forms of selenium and may be a means of supplementing selenium, research was conducted to determine how humans metabolize selenium from broccoli. Growing broccoli was loaded with a stable isotope of selenium and then fed to humans. Selenium from broccoli did not accumulate in the plasma as much as selenium from other chemical forms of salt, but less was excreted in the urine. These results indicate that selenium from broccoli may not pose much of a toxicological risk to humans because it does not accumulate in tissues to the extent that other forms of selenium do. (Human Nutrition)

Increased understanding of the role of copper nutriture in cognitive function. Research at Grand Forks Human Nutrition Research Center showed that diets moderately high in zinc (50 milligrams per day) can impair the short term memory of healthy postmenopausal women on a low copper diet (one milligram per day) as indicated by increased intrusions during verbal recall and reduced accuracy during immediate recall of numeric sequences. Few studies have examined the role of copper in cognitive function. Additional studies are planned to examine the relationship between dietary copper and cognitive function, including dementia. This research will impact recommended intakes and improve cognitive function in the elderly and other populations. This research will also address the negative effects of high zinc intakes, known to reduce copper absorption and affect biochemical indices of copper status. (Human Nutrition)

Fortification of folate has reduced the prevalence of low circulating folate and high homocysteine concentrations. The implementation of the FDA mandated folic acid fortification of enriched grain products was completed in early 1998. Researchers at the Human Nutrition Research Center on Aging at Tufts University assessed the impact of fortification on the folate status of adult Americans. They have conducted a long term follow-up of folate and homocysteine concentrations in the population-based Framingham Heart Studies. The research indicated that current levels of fortification were able to reduce the prevalence of low circulating folate and high homocysteine concentrations to levels seen in multivitamin supplement users. This was the first demonstration of the effectiveness of this important national program. (Human Nutrition)

Vitamin K may be a modifiable risk factor for osteoporosis. Researchers at the Human Nutrition Research Center on Aging at Tufts University in collaboration with Framingham Osteoporosis Study researchers evaluated associations between dietary vitamin K intake, apoE genotype, bone mineral density, and rate of hip fracture among elderly men and women participating in the original cohort of the Framingham Heart Study. Low vitamin K intakes were found to be associated with increased incidence of hip fractures in men and women. In contrast, neither low intakes of vitamin K nor apoE4 allele were associated with low bone mineral density. These findings suggest that vitamin K may be a modifiable risk factor for osteoporosis. (Human Nutrition)

Rapid method for determination of selenomethionine in foods and dietary supplements developed. Selenium deficiency has been linked to vascular disease including myocardial infarction. Dietary selenium can have both beneficial and toxic effects, occurring in both inorganic and organic forms. One important organic form, selenomethionine, is the analog of the sulfur amino acid methionine. The efficiency with which selenium is absorbed depends on the chemical form. A stable isotope dilution method was developed for the rapid determination of selenomethionine in foods and dietary supplements by researchers at the Beltsville Human Nutrition Research Center. One important finding is that food label claims for added selenium in the form of selenomethionine are not always accurate. This highly accurate and precise method should have a significant impact in providing the necessary tools to facilitate monitoring the accuracy of labeling claims for selenomethionine in dietary supplements. (Human Nutrition)

Nutrient Databank expanded. Expansion of the Nutrient Databank is essential to reflect more contemporary patterns of food consumption as well as to provide representative estimates for levels of components newly recognized by the scientific community as having potential benefits for public health. The Nutrient Database for Standard Reference 13 has been developed by investigators at the Beltsville Human Nutrition Research Center and scheduled for release in December 1999. SR 13 will provide estimates of composition for up to 82 components and 6,210 foods. This is the major product of the National Nutrient Databank System which provides the basis for all other food composition databases, including government, private sector, and academia. It will be available on the Nutrient Data Laboratory website (www.nal.usda.gov/fnic/foodcomp). (Human Nutrition)

Potential for newly developed barley cultivar to be used in dietary control of type 2 diabetes. Consumption of oats has been recognized as promoting beneficial reductions in glucose and insulin responses and cholesterol levels. The high soluble fiber content of oats has been determined to be a major factor in the reduction. Barley also has high amounts of soluble fiber, but it has not been studied as extensively as oats for reducing glucose or insulin response after a meal. A new barley cultivar has been developed which has three times the beta glucan found in standard oats. Researchers at the Beltsville Human Nutrition Research Center gave adult women test meals containing either oat flour, oatmeal, barley flour, or barley cereal and then took blood samples up to three hours after the test meals. Data showed that the high soluble fiber barley was more effective than oats in reducing both insulin and glucose levels. These results demonstrate the potential use for this high soluble fiber grain for dietary control of insulin independent diabetes mellitus. (Human Nutrition)

REE Goal 4 - To enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources.

Current Activities

ARS seeks to enhance the quality of the environment through a greater understanding of and building on agriculture's complex links with soil, water, air, and biotic resources. The scientific program in natural resources and sustainable agricultural systems involves multidisciplinary research to solve problems arising from the interaction between agriculture and the environment. New practices and technologies are developed to conserve the Nation's natural resource base and balance production efficiency and environmental quality. ARS collaborates with foreign research entities to address global environmental problems.

ARS' research accomplishments increase the productivity of U.S. agriculture while preserving and enhancing the Nation's natural resources. Current accomplishments include a new decision aid to predict phosphorus runoff, models to improve estimates of methane and ammonia emissions, devices to control salinity problems, new methods to remediate metal contaminated soils, development of environmentally friendly methods to control sprout and dry rot in potatoes, and new leather tanning technology.

Selected Examples of Recent Progress

Readily available municipal and industrial byproducts can be used to remediate metal contaminated soils. Low cost methods are needed to remediate soils contaminated by mining, ore processing, and industrial activities. A barren, zinc toxic site near Kellogg, Idaho was revegetated by scientists from Beltsville, Maryland using a mixture of municipal biosolids and wood ash. The new vegetative cover at the site reduced erosion, reduced off-site transport of metals, and provided a nontoxic food source for wildlife at a cost of $3,000 per acre. This is significantly less expensive than remediation through soil removal and replacement costing approximately $1 million per acre foot. The EPA is considering designation of this remediation method as a "presumptive remedy" for metal contaminated soils. (Soil, Water, and Air Sciences)

Using cover crops protects water and air quality better than other production methods without loss of productivity. Pesticides and nutrients used in agriculture often move from the point of application to areas such as streams and rivers or into the air where they can impact the environment and human health. Researchers in Beltsville, Maryland have made significant strides using cover crops that were grown, mowed, and left to serve as a medium for growing the main crop. Scientists are finding that cover crops can eliminate the use of some pesticides without reducing productivity, and can protect water and air quality better than conventional plastic mulches. (Soil, Water, and Air Sciences)

Fire accelerates soil erosion. Because fire consumes protective plant cover, the risk of significant post-fire soil erosion is high, particularly on steeper slopes. Recently, researchers at Boise, Idaho determined that post-fire water infiltration rates are about 50 percent less than pre-fire rates, thereby increasing the magnitude of surface runoff and associated soil erosion. These findings are being used as a basis for developing new resource managers' post-wildfire emergency and mitigation plans to protect soil resources and affected human populations residing nearby. (Soil, Water, and Air Sciences)

A new decision aid is developed to predict phosphorus runoff from pastures fertilized with manure. Off-site movement of nutrients from land on which manure has been applied can have a negative impact on the Nation's surface and ground waters. Information is needed about when and where runoff occurs in the landscape so pasture and manure management practices can be developed to maintain pasture productivity, while minimizing adverse environmental impacts. ARS scientists from Fayetteville, Arkansas and their cooperators have developed a predictive tool called a Phosphorus Index to identify areas in a pasture that are vulnerable to phosphorus losses. Producers, various support agencies (e.g., the NRCS and ES), and consultants can use the Index to determine areas in a pasture where manure can be safely applied and areas where special practices or precautions are required. (Integration of Agricultural Systems)

Reducing phosphorus concentrations in dairy cattle feed can help protect the environment. Phosphorus in animal manure is a potential contaminant of surface and ground water. Dairy farmers generally feed cows phosphorus in excess of standard recommendations, which is costly and increases the risk of phosphorus contamination of the environment. ARS researchers at Madison, Wisconsin have demonstrated that the phosphorus concentration in manure could be reduced 25 to 30 percent yet maintain milk production if phosphorus concentration in the feed was reduced 20 percent. ARS researchers in New Orleans are working on this problem by developing enzyme technology that will enable animals to use more of the phosphorus instead of eliminating it in waste. By using these approaches, producers will save money on dietary phosphorus supplementation and reduce the risk of manure phosphorus movement to surface water runoff. (Animal Sciences)

Evaluation of the basic structure and characteristics of the Yalobusha River prevents the likelihood of catastrophic flooding. The potential for catastrophic flooding along the downstream reaches of the Yalobusha River has increased dramatically since the 1960s because of channel dredging, straightening, and resulting natural processes. ARS scientists in Oxford, Mississippi saved the U.S. Army Corps of Engineers an estimated $3.4 million by performing an extensive topographic evaluation of the river basin and reducing the number of required grade control structures the Corps would have to use. The process ARS used will work in other

stream systems and save a significant amount of time and money in remediation efforts, disaster clean-up, and disaster relief. (Soil, Water, and Air Sciences)

Significant strides made to control salinity problems. Salinity seriously affects productivity on nearly one third of the United States' irrigated agricultural land constitutes a hazard to water quality, decreases soil fertility, and causes marked reduction in the quantity and quality of food. ARS scientists in Riverside, California are making strides dealing with the salinity problem by developing measurement methods, and finding uses for saline drainage waters. The advanced salinity measurement methodology was developed with the Bureau of Reclamation and the University of California. It will work as a viable approach to predict the loading of salt within irrigated fields for helping to target efforts to reduce the loading. Other research is focused on the use of saline drainage water for irrigating forage for agroforestry. These efforts will help producers and public agencies work toward better management of salinity problems. (Soil, Water, and Air Sciences)

Models developed to improve the day to day estimates of methane and ammonia emissions from Southeast swine facilities. Anaerobic lagoons used for animal waste processing are considered to be sources of greenhouse gases implicated in global warming (methane and nitrous oxide) as well as ammonia and ammonia aerosols that are potential air and water pollutants. ARS scientists in Watkinsville, Georgia have developed models to predict the various emissions from anaerobic lagoons. Further, they have found that most of the nitrogen is lost as an innocuous gas rather than ammonia. These studies improve estimates of greenhouse gas emissions and assist producers, regulatory agencies, and designers in minimizing the negative impacts of large scale animal production facilities. (Integration of Agricultural Systems)

More environmentally friendly leather tanning. ARS scientists at the Eastern Regional Research Center in Wyndmoor, Pennsylvania have demonstrated that hazardous sulfuric acid can be replaced with urea sulfate in the leather tanning process which is safer and has no negative effects on processing. Use of urea sulfate will provide a safer environment for tannery personnel and reduce the output of hazardous waste. (Commodity Conversion and Delivery)

Development of environmentally friendly methods to control storage sprout and dry rot of potatoes. Chemical sprout inhibitors are applied to over 50 percent of the potatoes harvested to extend storage life. Excessive use of chemicals, however, presents an environmental hazard. Bacteria naturally present in agricultural ecosystems can provide environmentally compatible alternatives to traditional chemical methods. ARS scientists in Peoria, Illinois, in cooperation with scientists at the Kimberly Research and Extension Center, Kimberly, Idaho, conduced pilot scale trials of ARS patented dry rot biological control agents and discovered that some not only lowered the incident of dry rot disease but also reduced storage sprout. The ability to suppress both dry rot and sprouting by applying these biocontrol agents to potatoes entering storage makes them attractive alternatives to chemicals. (Commodity Conversion and Delivery)

REE Goal 5--Empower people and communities, through research based information and education, to address the economic and social challenges of our youth, families, and communities.

Current Activities

ARS conducts research to identify new crops, products, technologies, and practices which increase profitability, expand markets, add value, and make small scale processing capabilities available in rural communities. Access to technologies and information is expanded and simplified so that ranchers and rural residents can obtain information in a timely manner.

ARS' research accomplishments provide economic opportunities to rural communities, and provide agricultural information and technologies to farmers, ranchers and other rural citizens. The accomplishments include development of improved erosion prediction technology, new technology for cost effective animal waste treatment, development of models to assist communities in evaluating impaired waterways, and new methods

to improve rangeland ecosystems. Also, progress has been made in Operation Full Stop to eliminate Formosan subterranean termites, and to biologically control fire ants.

Selected Examples of Recent Progress

It may be more difficult to deal with weeds as atmospheric carbon dioxide increases in the next century. Photosynthesis and growth are stimulated in weeds such as lambsquarters that use the so called C3 pathway for carbon assimilation. ARS scientists in Beltsville, Maryland have shown that the sensitivity of lambsquarters to glyphosate, the active ingredient in a widely used herbicide, is reduced at carbon dioxide levels expected in the next century. Application of the recommended herbicide dose killed 100 percent of the plants at current carbon dioxide levels, but higher doses were required as the carbon dioxide levels increased. In contrast, the herbicide's effectiveness on pigweed, which uses a different pathway for carbon assimilation, was not affected by higher carbon dioxide levels. These results indicate that weed management strategies may require modification in the future as atmospheric composition changes. (Soil, Water, and Air Sciences)

Ultra narrow row cotton production systems offer increased yields on marginal or degraded soils. More than 25 percent of the cotton produced in the Southeastern U.S. is grown on highly erodible land where improved production practices are needed to increase profitability and reduce soil erosion. ARS scientists at Auburn, Alabama and their cooperators have demonstrated that ultra narrow row production using a high residue conservation tillage system increased cotton yields on marginal soils up to 60 percent when compared to conventionally tilled standard row width cotton. Producers in the Southeastern U.S. are rapidly adopting this new technology. Acreage in ultra narrow row cotton production has increased from 3,500 acres in 1997 to approximately 200,000 acres in 1999. (Soil, Water, and Air Sciences)

Alternative crop rotations are more profitable than winter wheat fallow in the Central Great Plains. Approximately 20 million acres in the Central Great Plains are currently in a wheat fallow crop rotation. Unfortunately, fallow degrades soil quality, promotes soil erosion, and strains economic resources. ARS scientists at Akron, Colorado and their cooperators have developed alternative rotations that can replace wheat fallow. They found that rotations such as wheat-corn-proso millet-fallow or wheat-corn-proso millet could double land productivity compared to a winter wheat fallow rotation. These alternative rotations will allow producers in the Central Great Plains to increase profitability while improving soil quality and controlling weeds. (Soil, Water, and Air Sciences)

Improved erosion prediction technology has been developed. Erosion prediction technology is widely used by Federal, State, and local agencies and private organizations to assess the degree of soil erosion and to predict appropriate conservation practices to reduce erosion. The Revised Universal Soil Loss Equation (RUSLE) is widely used by the NRCS and other Federal and State agencies to predict erosion. ARS scientists at Oxford, Mississippi have recently improved the accuracy, utility, and ease of use of RUSLE. The new version of RUSLE, known as RUSLE2, has been released to NRCS for its evaluation and implementation. RUSLE2 is much easier to use than the previous version and it will allow conservationists at the NRCS local and field offices to develop more comprehensive conservation plans for land users. (Soil, Water, and Air Sciences)

Livestock grazing improves ecological health and stability of rangeland ecosystems. The magnitude of plant species diversity is a reflection of the health and integrity of ecological systems. ARS researchers from Cheyenne, Wyoming have found that long term results (40+ years) show properly managed grazing can improve ecological health and integrity as indicated by an increase in plant species diversity. ARS researchers in University Park, Pennsylvania found both plant and insect diversity were greater than expected on grazed Northeastern planted pastures. These results show that grazing, if properly managed, can be both economically profitable and environmentally friendly. (Soil, Water, and Air Sciences)

EPA uses Soil and Water Assessment Tool (SWAT) to assist State environmental agencies in evaluating impaired water bodies. Agricultural production is identified as a major nonpoint source of water contamination. ARS scientists in Temple, Texas have developed SWAT, a new and innovative prediction

model to simulate the movement of water and other watershed processes and the associated impacts to maintain the Nation's water resource base. The model is being used by scientists and engineers across the country to assess water quality, and is becoming part of EPA's and various State agencies' programs dealing with impaired waters. (Soil, Water, and Air Sciences)

The Wind Erosion Prediction System (WEPS 1.0) is delivered to NRCS. Soil loss and its degradation along with water and air pollution from wind erosion remain serious problems for producers and their communities. An improved wind erosion prediction system will provide more reliable technology for improving erosion prediction, developing control strategies, and assessing erosion damage and environmental impact. ARS researchers in Manhattan, Kansas delivered WEPS to NRCS for their use in April 1999. ARS will further assist NRCS by providing technical support and guidance in training, as NRCS strives to have WEPS operational in its field offices by FY 2002. Policymakers working on conservation reserve programs and global change programs, land managers, and the general public will benefit from the use of this improved prediction technology. (Soil, Water, and Air Sciences)

Operation Full Stop against Formosan subterranean termites in New Orleans. The Formosan subterranean termite is the most damaging structural insect pest in the U.S. It was first identified in the continental U.S. during the mid 1960s. Populations in coastal cities in thirteen Southern states and Hawaii are increasing rapidly, with exponential increases in New Orleans having been documented. Traditional control measures using liquid termicides have not been effective in controlling this species. Recently developed termite baiting systems and other new termicide chemistries show promise but have not been adequately tested for widespread field efficacy. ARS scientists in New Orleans have developed a nutritionally-based bait matrix that termites consume more readily than other forms of cellulose which allows more effective monitoring of termite populations and improved termicide delivery to the colony. (Animal Sciences)

Biological control of fire ants. Fire ant populations in the U.S. are five times greater than in their native range, with densities over 500 mounds per acre in some areas. Lack of natural enemies, predators, parasites, and pathogens may be largely responsible. The introduction of natural enemies from South America could greatly reduce fire ant populations. ARS Scientists in Gainesville, Florida imported and released biocontrol agents in fire ant infested suburban areas. Fire ant populations were reduced by as much as 61 percent in a field site where natural infections of the fire ant pathogen, ***Thelohania solenopsae***, have been monitored for over two and one-half years. Infections of the fire ant pathogen were detected in six of 10 States where field inoculations were made in 1998 to evaluate the efficacy of the pathogen under different geographic and climatic conditions. Scientists also released the phorid fly at test sites in six Southern States. At one site, they have expanded to cover more than 120 acres and were permanently established at another. Also, flies were seen attacking fire ant colonies almost three miles from the nearest fire ant infested population. Scientists are using biocontrol agents as a component of IPM strategies to control fire ants. (Animal Sciences)

New technology provides hope for an acceptable, cost effective treatment of animal waste. Due to the rapid growth of confined animal production, livestock waste treatment has become a major environmental challenge to reduce odor and ammonia emissions, and ground and surface water pollution while holding the line on operational costs. Scientists in Florence, South Carolina are adapting a state of the art Japanese technology that uses nitrifying bacteria to effectively remove ammonia from lagoons. The treated waste can then be used in riparian zones where it will be broken down without odor or harm to the environment. A cost effective system such as this would save livestock producers significant costs, protect water and air quality, and make livestock systems less controversial in communities. (Soil, Water, and Air Sciences)

Spray sprinkler irrigation is the economical choice for the Southern High Plains. In the Southern High Plains, agriculture consumes about 95 percent of the water pumped from the Ogallala aquifer which is being depleted. Extending the aquifer life by conserving water and protecting the region's ground and surface water quality, and saving producer resources in the meantime are critical problems being addressed by ARS researchers in Bushland, Texas. Spray irrigation with furrow dikes was found to be more efficient (in terms of crop yield and runoff) for most grain crops than the LEPA method (low energy precision application). Since spray irrigation

has a lower capital cost than LEPA and is adaptable to cropping systems that reduce wind and water erosion and improves water quality, this finding has more than economic benefits for producers and communities in the Southern High Plains. (Soil, Water, and Air Sciences)

Fencing livestock may be a thing of the past. Fencing to control grazing livestock is expensive and often less effective than desired. ARS researchers at Las Cruces, New Mexico have developed patentable technology that interfaces a satellite position system and a geographic information system (GIS) database to allow land managers to monitor and control the movement of animals on a continuous basis without using fences. Such technology will assist managers in their attempt to control and/or avoid grazing in streambanks and sensitive riparian areas, and planted croplands. This will protect valuable resources and limit the negative effects large grazing operations may have on water quality and the environment. (Integration of Agricultural Systems)

REE Goal 6--Management Initiative--Ensure and enhance worldwide access to agricultural information through the programs of the National Agricultural Library.

Current Activities

Through the programs and services of the National Agricultural Library (NAL), ARS ensures that agricultural information essential to the Nation is acquired, organized, disseminated, and preserved for current and future use and that appropriate advances are made to improve access to information. NAL's work is related to ARS goals and performance measures in extension, outreach, education, library services and higher education.

NAL's current accomplishments focused on expanding electronic access to information through increased access to networked resources, development of web-based products and services, and enhanced partnerships with information producers.

Selected Examples of Recent Progress

CALS transitions to Current Contents. In 1998, as part of the ARS Information Technology Management Initiative, an ARS-wide Research Information Needs Action Team was established to determine the information needs of the ARS research community. Based on the results of a survey of ARS researchers, this team recommended that the present Current Awareness Literature Service (CALS) expand its services and reduce costs by using Current Contents. (Current Contents is a product of the Institute for Scientific Information, Inc., that provides current awareness of journal literature to the research community.) In 1999, NAL began offering to the ARS community web-based access to Current Contents Connect and mediated access to Current Contents through the more traditional CALS. This transition resulted in a doubling of the CALS customer base while at the same time reducing the cost of the service. (Agricultural Information and Library Services)

AgNIC fully underway. The Agriculture Network Information Center (AgNIC), http://www.agnic.org, began its first year working with an elected Executive Board. During the annual meeting held at NAL, task forces were formed to develop membership, funding opportunities, web design, statistics standards, and a technical requirements document for a new technical infrastructure. Over the year, subject coverage expanded from six to 23 topics. NAL created a permanent position for the AgNIC Coordinator. The Coordinator will continue to work on expanding membership and subject coverage of the center. Web statistics for the AgNIC Alliance are over 20 million hits per month. (Agricultural Information and Library Services)

USDA history collection project. About 60 percent of the USDA history collection is now available through the USDA History Web site. The site includes: guides and finding aids, collection highlights, selected images, references materials, and links to related sites. This collection, which includes 660 linear feet of documents and more than 8,000 books and journals gathered over the last 50 years by Department historians, was transferred to NAL from ERS in 1996. (Agricultural Information and Library Services)

Access to electronic full text expands. NAL continued to locate and describe electronic resources available to the public on the Internet. The AGRICOLA database now serves as an organized index for online access to over 1100 documents, databases, electronic journals and Web sites on agriculture and related topics. Citations retrieved through standard author, title, and subject searches lead directly to the full text of selected resources. Priority is given to cataloging USDA electronic publications and databases and sites containing food safety research information. (Agricultural Information and Library Services)

Food safety research information office (FSRIO) established. NAL received funding to establish the FSRIO as mandated in the Agricultural Research, Extension and Education Act of 1998. The office will provide to the research community and general public, information on publicly funded and, as practical, privately funded food safety research initiatives for the purpose of preventing duplication and assisting in the assessment of food safety research needs and priorities. A needs assessment was conducted in FY 1999 and existing Web resources were identified. A prototype Web site has been developed and is undergoing stakeholder review. (Agricultural Information and Library Services)

Dietary supplements database launched. The Food and Nutrition Information Center and the NIH Office of Dietary Supplements, cooperated in the launching of an Internet site to help researchers and consumers find information on dietary supplements. The user friendly database, which went online January 6, 1999, is called International Bibliographic Database on Dietary Supplements (IBIDS) database and can be accessed at http://www.nal.usda.gov/fnic/IBIDS. As part of this collaboration, a needs assessment survey also was conducted and an evaluation of the prototype was completed in FY 1999. (Agricultural Information and Library Services)

USDA digital publications. The USDA Digital Publications Preservation Steering Committee, consisting of representatives from all USDA mission areas and selected external stakeholders, is providing direction and oversight for the implementation of a long term strategy to ensure that USDA digital publications being produced are systematically identified, prioritized, preserved, and archived. A project to inventory digital publications produced by ERS is underway and a conference for USDA staff on the importance of metadata (i.e., structured data describing other data used to find or manage information resources, such as a bibliographic citation) will be held in fall 1999. (Agricultural Information and Library Services)

Electronic document delivery. Electronic delivery of documents continued to expand as users were encouraged to send requests and receive materials electronically. Complimentary copies of electronic document delivery software and technical support were provided to USDA regional offices and to libraries of 1890 and 1994 land grant universities. Electronically submitted requests accounted for 84 percent of all document delivery requests received by NAL (a four percent increase over fiscal year 1998). Also during the year, electronic delivery of materials to patrons increased nine percent over 1998 and accounted for 49 percent of all delivery. (Agricultural Information and Library Services)

AGRICULTURAL RESEARCH SERVICE

Proposed Language Changes

The estimates include appropriation language for this item as follows (new language underscored; deleted matter enclosed in brackets):

Buildings and Facilities:

For acquisition of land, construction, repair, improvement, extension, alteration, and purchase of fixed equipment or facilities as necessary to carry out the agricultural research programs of the Department of Agriculture, where not otherwise provided, [$52,500,000] $39,300,000, to remain available until expended (7 U.S.C. 2209b): Provided, That funds may be received from any State, other political subdivision, organization, or individual for the purpose of establishing any research facility of the Agricultural Research Service, as authorized by law.

AGRICULTURAL RESEARCH SERVICE
BUILDINGS AND FACILITIES

Appropriations Act, 2000	$52,500,000
Budget Estimate, 2001	39,300,000
Increase in Appropriation	-13,200,000

SUMMARY OF INCREASES AND DECREASES - CURRENT LAW
(On basis of appropriation)

Facilities	2000 Estimated	Changes	2001 Estimated
Arizona: Water Conservation and Western Cotton Laboratory, Maricopa	$1,400,000	-$1,400,000	--
California: Western Human Nutrition Research Center, Davis	9,000,000	-9,000,000	--
Western Regional Research Center, Albany.	2,600,000	+2,300,000	$4,900,000
District of Columbia: U.S National Arboretum	500,000	+2,830,000	3,330,000
Hawaii: U.S. Pacific Basin Agricultural Research Center	4,500,000	-4,500,000	--
Illinois: National Center for Agricultural Utilization Research, Peoria	1,800,000	-1,800,000	--
Plant Physiology and Genetic Research Laboratory Urbana	400,000	-400,000	--
Iowa: National Animal Disease Center, Ames.	3,000,000	+6,000,000	9,000,000
Kansas: U.S. Grain Marketing Research Laboratory, Manhattan	100,000	-100,000	--
Louisiana: Southern Regional Research Center, New Orleans	5,500,000	-5,500,000	--
Maryland: Beltsville Human Nutrition Research Center, Beltsville	13,000,000	+300,000	13,300,000
National Agricultural Library, Beltsville	--	+1,770,000	1,770,000
Mississippi: Insect Rearing Facility, Stoneville	2,000,000	-2,000,000	--
Montana: Ft. Keogh Laboratory, Miles City	530,000	-530,000	--
New York: Plum Island Animal Disease Center, Greenport	3,500,000	+3,500,000	7,000,000
Pennsylvania: Eastern Regional Research Center, Philadelphia	4,400,000	-4,400,000	--
Utah: Poisonous Plant Laboratory, Logan	270,000	-270,000	--
Total Available	52,500,000	-13,200,000	39,300,000

PROJECT STATEMENT - CURRENT LAW
(On basis of appropriation)

	1999 Actual	2000 Current Estimate	Increase or Decrease	2001 Estimate
	AMOUNT	AMOUNT		AMOUNT
Total Obligations.....	$72,976,000	$64,900,000	-6,400,000	$58,500,000
Unobligated Balances: Available Start of Year.....	-102,226,000	-85,687,000	+12,400,000	-73,287,000
Available End of Year.....	85,687,000	73,287,000	-19,200,000	54,087,000
Total Available or Estimate.....	56,437,000	52,500,000	-13,200,000	39,300,000

AGRICULTURAL RESEARCH SERVICE

PROPOSED INCREASES AND DECREASES--BUILDINGS AND FACILITIES

A total increase of $39,300,000 for Buildings and Facilities, consisting of:

a) An increase of $9,000,000 for the ARS-APHIS Master Plan for Facility Consolidation and Modernization, Ames, Iowa.

Explanation of Change. In FY 1999, ARS and APHIS agreed to develop a combined preliminary modernization plan. In combining modernization efforts of both agencies, efficiencies can be realized by consolidating facilities, and phasing of construction simplified by eliminating the need for swing space. Combining efforts also presents an opportunity to create a world class facility consisting of new, state-of-the-art structures for biocontainment research, diagnostics, and vaccine evaluation. New construction allows the structures to be optimally sited along an upgraded infrastructure spine; provides for increased security, operations and maintenance efficiencies; and results in an enhanced research environment. Each agency had been separately pursuing implementation of a Master Plan for their respective sites. The total combined cost of the separate Master Plans was estimated to be $450 million. Each plan included substantial limitations due to the renovation of existing facilities. The preliminary combined Master Plan is estimated to cost $379 million and could be implemented in approximately half the time of separate Master Plans for a savings of $71 million.

The National Animal Disease Center (NADC, ARS) is the primary USDA facility for conducting research on animal diseases that are of economic importance to U.S. agriculture. Animal diseases are estimated to cost more than $16 billion in annual "on farm" losses in the United States. The NADC is the major animal health research facility in the USDA. Its research is recognized internationally for contributions which prevent and control animal diseases, and protects the food supply and the public health. Scientists at NADC have developed key diagnostic tools for hog cholera, bovine leukosis, bovine tuberculosis, and scrapie, and developed innovative vaccines for porcine parvovirus, bovine viral diarrhea virus, brucellosis, and shipping fever. The U.S. agriculture industry and APHIS have come to depend on scientists at the NADC to be responsive to their high priority research needs and to conduct timely, credible research targeted at solving problems that impact animal health, public health, and international trade.

The National Veterinary Services Laboratories (NVSL, APHIS) is the national and international reference diagnostic laboratory for these diseases. NVSL is responsible for preventing the incursion of foreign animal diseases into the United States, supporting eradication control programs, monitoring and surveillance for endemic diseases, laboratory certification, reference reagent production, and quality assurance. Its activities are key to continued trade in animals and animal products, both directly (import-export testing) and indirectly (monitoring and surveillance to assure importing countries of the low risk of animal imports). The use of biotechnology in monitoring and diagnosis (including PCR) is becoming increasingly important to fulfill the Nation's needs. Development and transfer of these technologies are an ongoing activity at NVSL.

The Center for Veterinary Biologics (CVB, APHIS) is the sole regulatory authority for animal vaccines and diagnostics used in the United States. Its activities include licensing, assuring quality manufacturing, inspection of manufacturing plants, confirmatory and investigatory testing, review of each batch of vaccine before marketing, and monitoring the safety and effectiveness of vaccines in the field. Vaccines and commercial diagnostic kits are a primary tool in animal health maintenance in the United States. Each year 70 billion doses are marketed, amounting to a $500 billion market. The use of biotechnology (including live virus vectors, naked DNA, and transgenic plant vaccines) in production and evaluation is growing, requiring state-of-the-art technology in the regulatory authority.

Most of the facilities at NADC were constructed in 1961 which have served the research community well for a long time, due largely to an aggressive maintenance program. Most of the facilities at NVSL and CVB were constructed in 1978, but both institutes currently reside in rented space in strip malls and office parks. The strip malls were constructed in 1972. The normal wear and tear on these facilities and supporting infrastructure has decreased their usefulness for meeting current research, diagnosis, and vaccine evaluation needs. They no longer satisfy the dramatic changes in requirements and expectations related to human and animal health and life safety issues, animal welfare, quality assurance, advances in biosafety and biocontainment measures, or regulatory issues addressing environmental and energy conservation concerns. Furthermore, advances in research procedures and technology make the current laboratories inefficient and obsolete.

New and expanded facilities are needed to meet ever increasing demands for research, diagnostic and biological services, much of which is due to expanding international trade. The facilities are also needed to assure readiness in the event of an emergency situation, and to meet quality assurance requirements for laboratory certification. The United States maintains the largest level of livestock production in the world, but the laboratory facilities which provide essential support to this industry are obsolete and inadequate and are now greatly surpassed by recently constructed state-of-the-art facilities in several other countries (e.g., Australia, Canada, Germany) in which livestock production is a fraction of that in the United States. Modern laboratory facilities are basic requirements in helping to protect our Nation's food supply and to prevent and/or control animal diseases which could be devastating to the livestock industry and the public through food scarcity and price escalation.

In FY 1999, ARS received $4.9 million for design and construction plans for maintenance and repair projects serving all research activities. In FY 2000, ARS received $3 million for renovation of two wings of a Biosafety Level 3 Animal Isolation Facility. In FY 2001, $9 million is requested to plan and modernize facilities for both ARS and APHIS. Specifically, $8 million is needed to complete planning and design for a new Biosafety Level 3-AG Animal Isolation Facility and a Biosafety Level 2 Animal Isolation Facility, as the first phase of the ARS-APHIS Combined Master Plan. These facilities will be located on the NADC grounds but will be used by ARS and APHIS scientists. Design and construction funds of $1 million will also be needed for utility distribution system improvements to support these two new facilities.

The BSL-2 facilities will be used for farm animals in an environment under BSL-2 biocontainment practices. The BSL-3AG facilities will be connected to the existing Necropsy/Incinerator building. There is currently a shortage of biocontainment animal space. The need for BSL-3AG space is especially critical to enable NADC to safely perform its mission in emerging diseases and end stage eradication. Existing BSL-2 space was originally constructed for disease-free animals, and retrofitted for containment use. It poses maintenance and operational deficiencies, does not meet all Association for Assessment and Accreditation of Laboratory Animal Care guidelines, and does not provide adequate biocontainment and animal holding measures to provide for animal welfare and caretaker safety. APHIS needs BSL-3AG space for Diagnostic Virology and Bacteriology Laboratories. It is not cost effective to upgrade existing structures to BSL-3AG standards.

Both Agencies (ARS and APHIS) agree, in context of the combined facilities master planning, that animal facilities are top priorities and should be constructed prior to laboratories. National program studies on bovine tuberculosis, brucellosis, and other highly infectious disease agents must, by law, be worked with in appropriate biocontainment. Current facilities fail to meet new standards for biocontainment and animal welfare.

b) An increase of $13,300,000 for modernization of facilities at the Beltsville Agricultural Research Center, Beltsville, Maryland.

Explanation of Change. The Beltsville Agricultural Research Center (BARC) was established in 1910. Current land resources total 6,582 acres and accommodate almost 800 buildings and structures in support of ARS research programs. The programs include Natural Resources and Environmental Sciences, Plant Sciences, Livestock and Poultry Sciences, and Human Nutrition. The staff at Beltsville totals about 1,500 employees, including 300 scientists.

BARC is the largest agricultural research center in the world in terms of program scope and concentration of scientists. It has long had a worldwide image of prominence in the agricultural sciences because of its history of research quality, contributions to agriculture, and prominent scientists. In addition, other Federal and State agencies such as the Food and Drug Administration, Environmental Protection Agency, Animal and Plant Health Inspection Service, National Aeronautics and Space Administration, Patuxent Wildlife Research Center, Departments of State and Treasury, and the University of Maryland have offices or laboratories at BARC, or facilities located adjacent to the Center.

Modernization of facilities at BARC, which began in FY 1988, is projected to continue through FY 2008 or later, depending on the availability of funding. In FY 1999, $2.5 million was appropriated to construct a new Poultry Facility and provide for miscellaneous small projects. In FY 2000, the Agency received an appropriation of $13 million for the Beltsville Human Nutrition Research Center (BHNRC) facilities and miscellaneous small projects. Funds are needed in FY 2001 to continue with the implementation of the BARC modernization plan currently projected to cost approximately $192 million.

In FY 2001, ARS proposes $13.3 million specifically for:

New BHNRC Facilities. A reevaluation of the human studies component of the BHNRC program has resulted in a reduction of planned space. BHNRC's needs can best be met with two new 40,000 g.s.f buildings, and by gutting and renovating Building 307 for a total of 149,300 g.s.f. In FY 1997, $1.7 million was appropriated to begin the design of the new buildings. The Agency received $11.4 million in FY 2000 for phase 1. In FY 2001, $11.4 million will be needed for phase 2, and $1.9 million will be needed for the design of the modernization of Building 307.

c) An increase of $4,900,000 for modernization of facilities at the Western Regional Research Center, Albany, California.

Explanation of Change. Facilities constructed in the late 1930s are hampering ARS scientists from conducting advanced research since methodology, technology, and approaches have significantly changed over the last half century. Additional resources are needed to renovate and modernize the major national research centers. The investment is essential for these Centers to regain the scientific capacity necessary to make discoveries that will contribute to development of new domestic and foreign agricultural markets.

Due to the age of the regional research centers, all major building systems--heating, ventilation, air-conditioning, electrical, roofs, and infrastructures (paving, steam and water lines, and waste treatment disposal systems)--have either reached or passed their useful life expectancies. Other existing deficiencies involving safety and health needs, such as fume hood upgrades, single pass air, and building code upgrade requirements need to be corrected. Additional appropriations are required in FY 2001 to enable ARS to proceed with the phased modernization efforts at the Western Regional Research Center (WRRC) in Albany, California.

WRRC Modernization. Industrial, food, and biological processing research and advanced manufacturing technology development is conducted at the Research and Development Facility (RDF) of WRRC. It plays a critical role in the Center's research programs. Since the original construction of the Center in the 1940s, very little renovation has occurred. As a result, room arrangements; interior finishes; and mechanical, plumbing, and electrical systems have deteriorated so they are no longer capable of supporting existing and future research programs.

In FY 1995, a construction contract was awarded using $800,000 of Agency funds to upgrade the "building envelope" of the RDF. In 1997, requirements for the modernization of the building's interior were developed using $180,000 of Agency funds.

The estimated design and construction costs for the entire project (five phases over nine years) is $22.2 million. The construction costs of the five phases is estimated to be $19.6 million (i.e., phase 1, $4.9 million; phase 2, $3.8 million; phase 3, $2.3 million; phase 4, $5.4 million; and phase 5, $3.2 million). In FY 2000, the Agency received $2.6 million for design of all phases. In FY 2001, ARS is requesting $4.9 million for construction of phase 1.

d) An increase of $7,000,000 for the modernization of the Plum Island Animal Disease Center, Greenport, New York.

Explanation of Change. The Plum Island Animal Disease Center (PIADC) is located on a Federally owned 840 acre island located about two miles from the eastern tip of Long Island, New York. Established by an Act of Congress in 1948, the former Fort Terry facility complex was transferred to USDA from the Department of Defense.

Plum Island is a unique national and hemispheric resource conducting state-of-the-art research and diagnostic work on foreign animal diseases that are an ongoing threat to U.S. livestock. Plum Island is the only site in the U.S. authorized by Congress to carry out research on foot and mouth disease and other highly contagious animal diseases. There are no alternative Federal or non-Federal mainland sites available with adequate biocontainment facilities to conduct this research.

APHIS' foreign animal disease diagnostic program is also located at PIADC. The Center places a high priority on the development of alternative disease control strategies that comply with animal welfare, ground water, and air pollution standards, and address hazards of chemicals and pesticides. Major renovation of the Center is needed to ensure high quality research and biosafety.

In 1989, ARS and APHIS began to develop an overall long range plan for the repair and maintenance of the buildings and supporting infrastructures. An architectural-engineering firm completed a detailed study of the condition and code deficiencies of the facility that totaled an estimated $90 million to correct. Insufficient funding provided throughout the years, escalating costs, an increased focus on bioterrorism, and the consequent need for level 4 containment facilities have resulted in increased construction costs.

In FY 2001, ARS proposes an increase of $7 million to provide for the continuation of the phased plan to modernize PIADC. Specific projects to be addressed in FY 2001 include:

Replace Boiler Plant, Phase 3. The 1990 facility deficiency study pointed out numerous deficiencies in the existing power plant. Besides numerous structural problems, the existing boilers were in an advanced state of deterioration. In 1993, the boilers had to be shut down and temporary mobile boilers installed outside of the boiler plant. In FY 1996 and 1999, design of a plant was funded to replace the exiting one. In FY 2000, ARS received $3.5 million for construction of phases 1 and 2. In FY 2001, ARS is requesting $3 million for construction of phase 3.

Firehouse/Motor Pool Consolidation. A recent study noted that these two facilities do not adequately serve the needs of the Center because of their present location. This project will consolidate these two facilities by the laboratory complex. In FY 2001, ARS is requesting $2 million for design and construction of the new facility.

Miscellaneous Small Projects/Contingency. In FY 2001, ARS is requesting $2 million for the design and construction of small modernization projects, demolition, contingencies, and support costs.

e) An increase of $1,770,000 for modernization of the National Agricultural Library, Beltsville, Maryland.

Explanation of Change. The National Agricultural Library (NAL) was built in 1968. Located in Beltsville, Maryland, NAL is one of four national libraries and the largest agricultural library in the world. The library houses a collection of more than 3.2 million items accumulated from all parts of the world in 50 different languages. It serves as a national resource for information on agriculture and related sciences. Information contained in the printed collection is disseminated through bibliographies, loans, photocopies, and reference services to agricultural colleges and universities, research institutions, government agencies, agricultural associations, industry, scientists, farmers and ranchers, and the general public. Electronic information is widely disseminated via the World Wide Web.

The building has two principal components totaling over 315,000 g.s.f. A tower consisting of fourteen floors and a penthouse is connected to an expansive two-story wing. A mechanical basement located below grade covers the entire building footprint.

The Library has undergone several modifications in its 30-year history. In recent years, new transformers and chillers have been installed, the elevators have been renovated, and a new roof membrane installed. However, in spite of regular maintenance, systems that were new in 1968 now exceed their 20 to 25 year life expectancy and are becoming unreliable and require replacement.

In 1991, NAL completed a comprehensive facility condition study that identified numerous code, mechanical, electrical, and architectural deficiencies. The total cost to correct these deficiencies was estimated at nearly $18 million. However, escalating costs and inconsistent funding levels have increased the costs to correct the deficiencies to almost $32 million. In addition, NAL needs to convert existing personnel space to storage space for expanding Library collections. Current plans are to relocate existing functions from the fourth floor to the first floor area, thereby freeing up needed stack space for collection storage. This consolidation effort will be accomplished in two phases.

ARS is requesting $1.77 million in FY 2001 to continue addressing major facility deficiencies. Specific projects to be addressed include:

Fourth Floor Renovation. In FY 1996 and 1997, NAL utilized repair and maintenance funds to begin a study and design of the renovations to the first floor. In FY 1998, $2.5 million was appropriated to begin construction of the first phase which will be completed in November 1999. In FY 2001, an additional $1.6 million is being requested to complete work on the fourth floor so that it can be used for collection growth.

Plumbing Renovation. In FY 2001, $170,000 is being requested to begin designing and constructing the replacement of plumbing systems within NAL.

f) An increase of $3,330,000 for modernization of the U.S. National Arboretum, Washington, D. C.

Explanation of Change. The U.S. National Arboretum (USNA) was created by an Act of Congress in 1927 as a center for research and education in the plant sciences. Since 1959, the Arboretum has also been open to the public as a display and show area for ornamental plant materials as well as continuing to function as a center for research and education.

The Arboretum is located in northeast Washington, D.C. on a 444-acre tract less than three miles from the Capitol and the White House, and which is reasonably accessible to major transportation routes. In 1927, this was a rural section of Washington. Since that time, the area surrounding the Arboretum has developed industrial centers, high-density housing, and heavily traveled roadways. Because of urbanization, the Arboretum has become a green oasis in an otherwise intensely developed metropolitan

area. Its proximity to many tourist attractions and ease of access offers countless educational opportunities for residents of the city and the estimated 28 to 36 million who visit Washington D.C. each year.

Because of aging, many of the major Arboretum building systems--heating, ventilating, air conditioning, electrical, roofs, and infrastructure (paving, fences, steam and water lines)--have either reached or passed their useful life expectancy. Other facility deficiencies involving safety and health needs must also be corrected. Cost estimates have been made to upgrade the facilities to present day standards.

ARS requests $3.33 million in FY 2001 for the following projects:

Administrative Building Modernization. The Administrative Building consists of about 36,178 g.s.f. of mixed use including offices, laboratories, an auditorium, and a herbarium. Based on a 1990 facility condition study, facility deficiencies exist involving electrical and HVAC systems, fire protection and handicap accessibility, and laboratory layout. Since the 1990 facility condition study, the electrical and HVAC systems have deteriorated to such an extent that complete failure is imminent, threatening closure of key aspects of the Arboretum's research and education activities. Also, fire protection systems are lacking and accessibility accommodations are poor. In FY 2001, $530,000 in design funds are being requested.

Automate and Replace Lateral Irrigation Lines. ARS has completed the replacement of the main irrigation distribution system. This project will address the remaining lateral lines leading into the collections and research plots, as well as installing an automated control system. In FY 2001, $2.8 million is requested for design and construction costs.

Agricultural Research Service
Status of Construction Projects as of December, 1999

Status of research facilities authorized or funded in prior years and reported as uncompleted in the 2000 Explanatory Notes, is as follows:

NOTE: Design criteria, provided by ARS, specifies the program requirements for the facility and forms the basis for negotiation of architect-engineer contracts. Diagrammatic drawings or concept drawings provide the basis for the first review of the architect's design. Tentative drawings or architect's design are provided by the architect for firming up cost estimates and basis for developing the completed, and final working drawings.

Location and Purpose	Year	Amount of Funds Provided	Description
Arizona, Maricopa	1995 Planning	$ 396,000	Planning and design of the new laboratory facility is fully funded. Pending lease agreement, pre-design and design contract will be awarded in the Fourth Quarter of FY 2000.
Water Conservation	1999 Planning	500,000	
and Western Cotton	2000 Planning	1,400,000	
Laboratory	and Design		
	Total	2,296,000	
California, Albany	1994 Planning and	$ 1,161,000	Construction of Phase 7 modernization of the North Wing is complete. Design for the modernization of the Research and Development Facility will be awarded in the Second Quarter of FY 2000. In FY 2001, $4.9 million is requested for construction of Phase 1 of the R&D facility.
Western Regional	Construction		
Research Center	1995 Construction	919,000	
	1997 Construction	4,000,000	
	2000 Design	2,600,000	
	Total	8,680,000	
California, Davis	1998 Planning and	$ 1,700,000	Planning, design, and construction of the new laboratory facility is fully funded. Pre-design and design contract will be awarded in the Second Quarter of FY 2000 for completion by the Second Quarter of FY 2002.
Western Human Nutrition	Design		
Research Center	1998 Construction	3,500,000	
	1999 Construction	6,150,000	
	2000 Construction	9,000,000	
	Total	20,350,000	

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
California, Parlier	1993 Planning	$ 300,000	Construction of the new facility is scheduled for completion in the Fourth Quarter of FY 2000.
Horticultural Crop	1994 Planning	2,630,000	
Research Laboratory	1995 Construction	2,630,000	
and Water Management	1998 Construction	23,400,000	
Research Laboratory	Total	28,960,000	
District of Columbia			
U.S. National Arboretum	2000 Planning and Design	$ 500,000	Design of a new entrance from Bladensburg Road will be awarded in the Third Quarter of FY 2000. In FY 2001, $3.330 million is requested for modernization of the Administrative Building and for design and construction of the Irrigation System lateral lines into collections and research plots, as well as installation of an automated control system.
Florida, Ft. Pierce	1994 Planning	$ 2,900,000	Laboratory Building was completed in the First Quarter of FY 2000.
Horticultural Research	1995 Construction	2,900,000	
Laboratory	1996 Construction	1,500,000	
	1997 Construction	27,000,000	
	Total	34,300,000	
Georgia, Athens	1992 Planning	$ 400,000	This project is on hold due to uncertainty of additional planning and construction funds.
Poultry Disease	1993 Construction	677,000	
Laboratory	Total	1,077,000	
Hawaii, Hilo	1999 Planing and Design	$ 4,500,000	Pending lease agreement, pre-design and design of the Main Laboratory and Rearing Facility is scheduled for award in the Fourth Quarter of FY 2000, for completion by the First Quarter of FY 2002.
U.S. Pacific Basin			
Research Center	2000 Construction	4,500,000	
	Total	9,000,000	

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Illinois, Peoria	1992 Planning	$ 1,825,000	Construction of Segment 1 of the Pilot Plant renovation was completed in the Third Quarter of FY 1999. Segment 2 construction is scheduled for completion in the Third Quarter of FY 2000. Design of Segment 3 construction is scheduled for completion in the Second Quarter of FY 2000. Construction of Segment 3 is scheduled for award in the Fourth Quarter of FY 2000. Design of the Chemical Wing modernization is scheduled for award in the Second Quarter of FY 2000.
National Center for Agricultural Utilization Research	1993 Planning	1,545,000	
	1996 Construction	3,900,000	
	1997 Construction	1,500,000	
	1998 Modernization	8,000,000	
	1999 Modernization	8,200,000	
	2000 Modernization	1,800,000	
	Total	26,770,000	
Illinois, Urbana			
Plant Physiology and Genetic Research Laboratory	2000 Planning and Design	$ 400,000	Pending lease agreement, pre-design and design contract for a new greenhouse complex is scheduled for award in the Third Quarter of FY 2000.
Iowa, Ames	1999 Modernization	$ 2,957,000	Design of the Waste Water Treatment Plant is scheduled for completion in the Second Quarter of FY 2001. Construction is scheduled for award in the Third Quarter of FY 2001. Renovation of Building 3bc is scheduled for award in the Third Quarter of FY 2000. In FY 2001, $9 million is requested to complete planning and initiate design and construction efforts for modernizing facilities for both ARS and APHIS.
National Animal Disease Center	1999 Reprogramming	1,943,000 *	
	2000 Modernization	3,000,000	
	Total	7,900,000	

* Reprogrammed from the National Swine Research Center as directed by Congress in the FY 1999 Omnibus Bill.

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Kansas, Manhattan	1995 Planning	$ 950,000	Design for the renovation of the facility was completed
U.S. Grain Marketing	1996 Construction	1,000,000	in FY 1998. Construction of Phases 1 and 2 are scheduled
Research Laboratory	1997 Construction	500,000	for completion in the Fourth Quarter of FY 2000. FY 2000
	1999 Construction	1,400,000	funds will be used to update FY 1998 design documents.
	2000 Planning and Design	100,000	
	Total	3,950,000	
Louisiana, New Orleans	1992 Construction	$ 1,950,000	The modernization of the Chemical Wing is fully
Southern Regional	1993 Planning and Construction	1,651,000	completed. Design of the Industrial Wing, which is the next modernization phase, is complete. Phase 1 construction
Research Center	1994 Construction	2,667,000	of the Industrial Wing is scheduled for completion in the
	1995 Construction	2,934,000	Third Quarter of FY 2001. Funds for the construction of
	1996 Construction	900,000	Phases 2A and 2B of the Industrial Wing were appropriated
	1998 Design	1,100,000	in FY 2000.
	1999 Modernization	6,000,000	
	2000 Modernization	5,500,000	
	Total	22,702,000	

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Maryland, Beltsville	1988 Modernization	$ 5,750,000	Ongoing Projects:
Beltsville Agricultural	1989 Modernization	6,100,000	1995 Funds:
Research Center	1990 Modernization	9,860,000	Construction:
(BARC)	1991 Modernization	15,999,792	-Construction of Building 004 modernization is scheduled for completion in the Third Quarter of FY 2001.
	1992 Modernization	16,000,000	
	1993 Modernization	13,547,000	
	1994 Modernization	19,700,000 *	
	1995 Modernization	3,960,000	1997 Funds:
	1996 Modernization	8,000,000	Design:
	1997 Modernization	4,500,000	-Design of the Beltsville Human Nutrition Research Center (BHNRC) is scheduled for completion in the Second Quarter of FY 2000.
	1998 Modernization	3,200,000	
	1999 Modernization	2,500,000	
	2000 Modernization	13,000,000	
	Total	122,116,792	1998 Funds:
			Design:
			- Pre-Design contract for the Design/Build of the Feed Center was awarded in the First Quarter of FY 1999. Full Design/Build contract was awarded in the Fourth Quarter of FY 1999 for completion in the Second Quarter of FY 2000.
			Construction:
			- Construction of the Fiber Optic Backbone cable is scheduled for completion in the Second Quarter of FY 2000.

* Appropriated under USDA Rental Payments Account.

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Maryland, Beltsville (cont'd) BARC			1999 Funds: Design/Build: - Design contract for the new Poultry Production facility was awarded in the First Quarter of FY 1999. Construction contract was awarded in the Fourth Quarter of FY 1999 for completion by the First Quarter of FY 2001. 2000 Funds: Construction: - Construction of Phase 1 of the Beltsville Human Nutrition Research Center is scheduled for award in the Fourth Quarter of FY 2000. 2001 Request Design: - $1.9 million for design of Building 307 modernization. Construction: - $11.4 million is requested for construction of Phase 2 of the Beltsville Human Nutrition Research Center.

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Maryland, Beltsville (cont'd)			
National Agricultural Library	1998 Modernization	$ 2,500,000	Design for Phase 1 of the multi-phase modernization of NAL is complete. Construction contract was awarded in the Fourth Quarter of FY 1998 and completed in the First Quarter of FY 2000. Construction contract for the replacement of the Air Handling Unit was awarded in the Fourth Quarter of FY 1999 for completion by Second Quarter of FY 2000. In FY 2001, $1.77 million is requested for construction of the 4th floor renovation as well as design for mechanical, electrical, and plumbing projects.
	1999 Modernization	1,200,000	
	Total	3,700,000	
Michigan, East Lansing	1992 Planning	$ 250,000	Design of Phase 1 of the modernization is scheduled for completion in the Third Quarter of FY 2000.
Avian Disease and Oncology Lab	1993 Planning	212,000	
	1998 Planning and Design	1,800,000	
	Total	2,262,000	
Mississippi, Stoneville	1998 Planning and Design	$ 900,000	Design contract is scheduled for completion by the Third Quarter of FY 2000. Construction funding appropriated in FY 2000 will be used to complete the sitework.
Biocontrol and Insect Rearing Facility	1999 Planning and Design	200,000	
	2000 Construction	2,000,000	
	Total	3,100,000	
Montana, Miles City	2000 Planning and Design	$ 530,000	Pre-design and design contract for modernizing existing facilities is scheduled for award in the Fourth Quarter of FY 2000.
Ft. Keogh Laboratory			

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Montana, Sidney Pest Quarantine and Integrated Pest Mgmt.	1998 Planning and Design	$ 606,000	Planning and design of the new facility was completed in the First Quarter of FY 2000. Construction contract is scheduled for award in the Third Quarter of FY 2000.
	1999 Construction	7,300,000	
	Total	7,906,000	
New Mexico, Las Cruces Jornada Range Research Station	1998 Planning and Design	$ 700,000	Design for the replacement facility was completed in the First Quarter of FY 2000. Construction contract is scheduled for award in the Third Quarter of FY 2000 for completion by the Fourth Quarter of FY 2001.
	1999 Construction	6,700,000	
	Total	7,400,000	
New York, Greenport Plum Island Animal Disease Center	1993 Design and Construction	$ 2,540,000	Pre-design for repair of the Sewage Decontamination Plant was awarded in the Fourth Quarter of FY 1999. The Waste Water Treatment project is on hold pending resolution of remediation request with EPA/DEC. Replacement of various electrical distribution systems will be completed in the First Quarter of FY 2000. Boiler Plant Replacement Design is scheduled for completion in the Second Quarter of FY 2000. Boiler Plant and Decontainmination Plant design is on hold pending resolution of Building 101 plans. In FY 2001, $7 million is requested for continuing modernization of the Center.
	1994 Construction	1,475,000	
	1995 Construction	1,168,000	
	1996 Design and Construction	5,000,000	
	1997 Construction	5,000,000	
	1998 Construction	2,000,000	
	1999 Modernization	3,500,000	
	2000 Modernization	3,500,000	
	Total	24,183,000	

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Pennsylvania, Wyndmoor Eastern Regional Research Center	1997 Construction 1998 Modernization 1999 Modernization 2000 Modernization Total	$ 4,000,000 5,000,000 3,300,000 4,400,000 16,700,000	Modernization of facilities is being accomplished in nine phases. Construction of Phase 1 (Power Plant) is complete. Phase 2 construction of the Engineering Research Laboratory (Pilot Plant) is scheduled for completion in the Second Quarter of FY 2000. Construction of Phases 3 and 4 (Chemical Wing Laboratory) is scheduled for completion in the Second Quarter of FY 2001. Phase 5 construction (Chemical Wing Laboratory) is scheduled for award in the Second Quarter of FY 2001. Funds for construction of Phase 6 (Chemical Wing Laboratory) were provided in FY 2000.
South Carolina, Charleston U.S. Vegetable Laboratory	1988 Feasibility 1990 Planning and Construction 1994 Construction 1995 Construction 1996 Construction 1997 Construction 1998 Construction Total	$ 50,000 1,135,000 909,000 5,544,000 3,000,000 3,000,000 4,824,000 18,462,000	Design for the replacement facility is complete. Construction contract for Phase 1 of the two phased project was awarded in the Second Quarter of FY 1999. This contract was however terminated due to financial difficulties with the contractor. Pending takeover agreement, construction award is scheduled with the second contractor for the Second Quarter of FY 2000 for completion by the Fourth Quarter of FY 2001.

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
Texas, Lubbock	1978 Feasibility	$ 100,000	Construction of the Laboratory/Office Building was completed in the Third Quarter of FY 1999. Construction of the Greenhouse is scheduled for completion in the Fourth Quarter of FY 2000.
Plant Stress and	1979 Planning	800,000	
Water Conservation	1984 Planning	500,000	
Laboratory	1990 Construction	500,000	
	1991 Planning	599,992	
	1992 Construction	1,300,000	
	1993 Construction	1,101,000	
	1994 Construction	551,000	
	1995 Construction	1,051,000	
	1996 Construction	1,500,000	
	1997 Construction	8,100,000	
	Total	16,102,992	
Texas, Weslaco	1994 Planning	$ 1,400,000	Completion of the Laboratory/Office Building and Greenhouses is scheduled in the Second Quarter fo FY 2000. Other phases of modernization will be undertaken as funds become available.
Subtropical Agricultural	1995 Construction	3,009,000	
Research Laboratory	1996 Construction	1,000,000	
	1996 Reprogramming	383,000	
	1997 Construction	4,000,000	
	Total	9,792,000	
Utah, Logan	1998 Planning and Design	$ 600,000	Planning and design contract was awarded in the Fourth Quarter of FY 1999 for completion by the Second Quarter of FY 2001. Design for the replacement facility has been fully funded with the additional appropriations in FY 2000.
Poisonous Plant			
Laboratory	1999 Planning and Design	30,000	
	2000 Planning and Design	270,000	
	Total	900,000	

Status of Construction Projects as of December, 1999 (cont'd)

Location and Purpose	Year	Amount of Funds Provided	Description
West Virginia, Leetown	1995 Planning	$ 1,921,000	Construction contract was awarded in the Fourth Quarter of
National Center for Cool	1997 Construction	6,000,000	FY 1999 for completion by the Fourth Quarter of FY 2000.
and Cold Water	1998 Construction	6,000,000	
Aquaculture	1999 Construction	2,000,000	
	Total	15,921,000	
Montpellier, France	1993 Design	$ 500,000	Construction of the new facility was completed in the Fourth
European Biological	1993 Construction	470,000	Quarter of FY 1999.
Control Laboratory	1998 Construction	3,400,000	
	Total	4,370,000	



United States Department of Agriculture



Cooperative State Research, Education, and Extension Service

FY 2001 President's Budget Proposal

A Summary of the President's Budget Proposal for CSREES-USDA as Presented to the Congress of the United States

Advancing Knowledge for the Food and Agricultural System—Overview

The President's Fiscal Year (FY) 2001 Budget Proposal includes discretionary funding totaling $972,395,000. This represents an increase of $22,199,000, or approximately 2.3 percent, from the FY 2000 post-rescission appropriated amount of $950,196,000. Also included is mandatory funding of $120,000,000 for the Initiative for Future Agriculture and Food Systems under section 401 of the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) for competitive research, extension, and education grants to address critical and emerging agriculture issues. Mandatory funding also is available under the Fund for Rural America, where a minimum of $20,000,000 is to be provided for a wide range of research, extension, and education activities. Mandatory funding of $2,500,000 also is available under the Community Food Projects grants program.

The CSREES FY 2001 budget proposes increases for:

- competitively awarded grants programs
- targeted problem areas
- integrated research, extension, and education activities
- expanded partnerships needed to reach diverse audiences
- streamlined management and improved accountability

The CSREES Discretionary Budget portfolio for FY 2001 encompasses a broad and complex set of programs framed around six CSREES Strategic Goals. Below are highlights of these programs which focus on the development of tools to help agriculture compete in the long-term, enhancement of the environment, improvement of human health, and development of human capacity. The program highlights are arrayed under the Strategic Goal to which they make the most significant contribution:

Goal 1, "Agricultural Production System that is Highly Competitive in the Global Economy"

Achieving sustained, long-term improvement in the competitive position of U.S. agriculture relies critically on the Federal government's assurance that producers and marketers have access to the basic tools for success. Studies have shown that successful producers (farmers, ranchers, and foresters) are better educated, more apt to adopt new technology, have lower costs of production, and take better advantage of or have more opportunities for spreading production and marketing risk across alternative enterprises and mechanisms than their less successful counterparts.

Biobased Products Program - This new program is part of the broad Department initiative that responds to Executive Order 13134 entitled, "Developing and Promoting Biobased Products and Bioenergy" which was signed by the President in August 1999. The Biobased Products Program proposes a systems approach for product development that will generate information and tools for farmers to grow, harvest, and handle alternative crops and for manufacturers to convert raw materials to useful products for industry and/or consumers.

International Science and Education Grants - The U.S. economy, particularly its agricultural and natural resources sectors, is being challenged as never before to develop and use new technologies, to expand industrial uses of food and fiber materials, and to operate in globally competitive and environmentally responsible ways. This new program will strengthen U.S. economic competitiveness and promote international market development for U.S. agriculture through such means as international collaborative research exchanges and partnerships and globally informed curricula.

National Research Initiative - Increased funding in the National Research Initiative will support projects focusing on the development of integrated production, processing, and distribution systems for generation of high value products, with an emphasis on local production and processing. Increased funding will be used to utilize advances in biotechnology to develop new agricultural products. Funds also will support projects that examine the economics of small farms and their contributions to local economies.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Food and Agricultural Sciences National Needs Graduate Fellowship Grants - At a time when nations worldwide have grasped that superior human capital is central to social, economic, and technological progress, U.S. food and agriculture competitiveness may ultimately be at risk from erosion of the scientific base. An increase is proposed for this program, which is the only Federal program specifically targeted to the recruitment and training of outstanding graduate students in the food and agricultural sciences. The expansion of this program will support the recruitment and training of master's as well as doctoral students, a change that is essential if more minority students are to be recruited into the program.

Sustainable Agriculture Research and Education (SARE) - Increases are sought in the research and extension components of the SARE program in FY 2001 to focus on organic farming. Research funds will be used to facilitate the development of organic agriculture production and processing methods, evaluate the potential economic benefits to producers and processors who use organic methods, and explore market opportunities for organic products. Extension funds will support the development of knowledge and expertise in organic farming and marketing among extension and other agricultural professionals through SARE's Professional Development Program.

Goal 2, "Safe and Secure Food and Fiber System"

A safe and secure food system is necessary to ensure the well-being and prosperity of the United States. Food safety is dependent upon a production system that is well-integrated into an environment that is as pathogen-free as possible, a food processing and handling system free of pathogen contamination, and an educated public to ensure that both producers and consumers know their role in providing for the safe production, handling, and consumption of food. Food security is dependent upon an efficient and productive agricultural system based on healthy crops and livestock.

Higher Education Challenge Grants Program - This program is USDA's flagship initiative to recapture excellence in agricultural education. Current funding does not meet existing needs or demand, and does not capture the benefits of enhanced curricula, faculty development, student experiential learning, instructional delivery systems, scientific instrumentation, and student recruitment and retention. Increased funding will enhance programs and capabilities for educating baccalaureate students in priority food and agricultural science areas, including food safety.

Improved Pest Control/FQPA Implementation - The Food Quality Protection Act of 1996 (FQPA) requires EPA to reassess all pesticide tolerances within 10 years of passage of the Act and to change its standard of evaluating pesticides from an acceptable risk/benefit profile to a reasonable expectation of no harm. The EPA review will likely impact pesticides used in agriculture. USDA policy places a high priority on developing the technology needed for safe substitutes for commonly used pesticides. CSREES is proposing increases in the following Improved Pest Control programs to address FQPA implementation requirements: Pest Management Alternatives; Expert IPM Decision Support Systems; IR-4 Minor Crop Pest Management; Pesticide Applicator Training; Integrated Pest Management extension; Pesticide Impact Assessment; Crops at Risk from FQPA Implementation; FQPA Risk Mitigation for Major Food Crop Systems; and Methyl Bromide Transition.

National Research Initiative - Increased funding will support research that identifies emerging and re-emerging foodborne diseases through enhanced or new surveillance methods. Funding increases also will enable increased emphasis on epidemiological approaches for food safety. Food security issues will be addressed through increased NRI funding for the support of research in animal and plant genomics directed at identifying, mapping, and understanding the function and control of genes. Research in microbial genomics will be directed at the genomes of microbial species which make important contributions to the growth, development, and health of plants, animals, and the environment.

Goal 3, "Healthier, More Well-Nourished Population"

Establishing the scientific basis for optimal health, developing knowledge of the eating habits of Americans, and modifying food intake behavior are critical components to having a well-nourished population. An increasingly important component to having a well- nourished population is empowering our communities to build their capacities to meet a greater share of their food needs.

Anti-Hunger and Food Security Grants Program - Despite the strongest economy in decades, a recent USDA study indicates that 36 million Americans live in households suffering from hunger or are on the brink of hunger. This new program will provide support to non-profit entities for projects that reduce hunger, improve nutrition, bolster community food security, and help families move from poverty to self- sufficiency.

Expanded Food and Nutrition Education Program (EFNEP) - The delivery and use of dietary information is critical to meeting the needs of undernourished portions of the population, especially children. EFNEP, through the Cooperative Extension System, delivers information to at-risk populations to help improve their nutrient intake. Increased funding will enhance these efforts, which in turn contribute to the prevention or delayed onset of nutrition-related chronic diseases and conditions among program participants.

National Research Initiative - Increased National Research Initiative funding will support research on the nutritional impact of newly "designed" foods. Advances in food technology have provided the consumer with ever increasing food choices claiming increased health benefits due to selection in favor of certain ingredients. Thus, a new approach is being taken to establish nutrient standards which go beyond recognizing the role of nutrients in preventing nutritional deficiencies.

Goal 4, "Achieve Greater Harmony between Agriculture and the Environment"

As a Nation, we increasingly value the natural world - clean air and water, unique ecosystems, and pristine land. We recognize that, given the vast amounts of land being used in agricultural or forest production, we must ensure that our production practices, as well as our public policies and programs affecting these practices, are consistent with the dual objectives of promoting competitiveness while preserving natural resources and environmental quality. To achieve these goals, a better understanding of the complex interactions between agricultural production and the environment is needed.

Invasive Species Program - The invasion of noxious and exotic plant, animal, insect, disease, and other microbial pests is an issue of profound importance to the nation's land and water resources. The Invasive Species Program is being established to target invasive species issues on an ecoregional basis.

Water Quality Program - Water quality is an important National concern, as evidenced by the President's Clean Water Action Plan. This is the second year of support for the CSREES integrated research and extension water quality program, which addresses such issues as the connection between agricultural practices and outbreaks of Harmful Algal Blooms, which can lead to conditions that cause massive fish-kills, human health problems, and significant economic losses to the seafood industry. Odors and pathogens from agricultural animal manures will also be addressed. The fate and transport of pathogens from manure will require extensive research followed by the transfer of the resulting knowledge to livestock and poultry producers through the Cooperative Extension System.

National Research Initiative - Increased NRI funding also will allow for meaningful support for fundamental processes governing population and community dynamics, which will include research on invasive species, threatened and endangered populations and communities, responses of populations and communities to a changing environment, and species and community diversity. Support for the Global Change program will be increased because greater emphasis is needed on research that increases understanding of the possible impacts of global environmental change on the sustainability of agriculture and forestry. Additional funding will bolster the NRI Agricultural Systems Program which provides for mission oriented, multidisciplinary approaches to system levels studies of whole farms, whole ecosystems, and comprehensive management practices which are especially important to small-and medium-sized farms.

Goal 5, "Enhanced Economic Opportunity and Quality of Life for Americans"

Americans recognize that their quality of life depends largely on economic, physical, and institutional factors affecting their families, businesses, and communities. The fast pace of changes in these factors, and their increasingly complex interactions, present a growing challenge. CSREES, in partnership with the land-grant university system, enhances the capabilities of individuals, families, and communities to improve their quality of life.

Youth Farm Safety Education and Certification - Children working in agriculture face risks of injury and death. While injuries to children who work in agriculture may occur less frequently than to those working in some other industries, they tend to be more serious when they do occur. This new program will establish a competitive grants program for support to States to provide formal safety training and certification programs targeted to youth who are 16-17 years of age. The initiative will build on existing delivery systems of the Cooperative Extension System educators and vocational agriculture teachers. Training delivery to hard-to-reach populations, such as youth who have left school, migrant youth, and others with limited access to school-based programs, will be facilitated through partnering among Federal agencies, and with state and local agencies.

Native American Institutions Endowment Fund - Facilities at the Tribal Colleges are all too often in poor condition. Many campuses consist largely of condemned buildings that pose a significant health and safety risk to both students and faculty. Current facilities at these institutions do not place them in a strong position to address research, higher education, or extension issues related to the food and agricultural sciences which are important to the communities they serve. Funding is proposed to increase the corpus of the endowment which will increase the formula-based disbursement of interest earned. Institutions will be strongly encouraged to use the interest derived from the endowment fund to support facility renovation and construction activities.

Children, Youth, and Families at Risk - Every day in America, 13 million preschool children are in child care arrangements, 24 million school-age youth are in need of programs, and 5 million youth are left without supervision. The need for quality care arrangements and programs for infants through teens has never been greater. Through a proposed funding increase in this program, land-grant university faculty will increase efforts to improve affordability, accessibility, quality, and sustainability of child care programs. Programs will focus on children and families with greatest need, such as: small farm families, migrant workers, low income, isolated rural, inner city poor, people moving from welfare to work, and new immigrant families facing language as well as economic and academic challenges to becoming self-sufficient in America.

Extension Indian Reservations Program - This program supports extension agents on reservations to address the unique needs and problems of Indian tribes in agriculture, agriculture-related youth programs, and other tribally- identified priorities, such as food and nutrition, parenting, financial management, household management, and personal esteem and maintenance. Increased funding will enhance the ability of extension agents to provide educational programs to isolated and under-served audiences on the reservations.

Goal 6, " Responsive and Effective Management Systems"

CSREES strategies to ensure responsive and effective management of USDA's extramural research, extension, and education programs include: (1) strengthening the Federal/State partnership; (2) integrating research, extension, and education activities as appropriate; (3) improving information management systems which are accessed by both internal and external users; and (4) participating in efforts to improve financial management within USDA.

Research, Education, and Economics Information System - The Research, Education, and Economics Information System (REEIS) will be a state-of-the-art information system which will help document the attainment of Research, Education, and Economic mission area outcomes and enable CSREES to satisfy reporting demands and performance requirements of the Government Performance and Results Act. In addition, REEIS will help facilitate implementation of provisions of the Agricultural Research, Extension, and Education Reform Act of 1998. Increased funding will support the broad implementation of the system.

Cooperative State Research, Education, and Extension Service ($000)

Programs	FY 2000 Appropriation Act	FY 2001 President's Budget
Research and Education Activities		
Base Programs:		
Hatch Act	$180,545	$180,545
McIntire-Stennis Cooperative Forestry	21,932	21,932
Evans-Allen Program	30,676	30,676
Animal Health and Disease, Section 1433	5,109	5,109
Subtotal	238,262	238,262
Special Research Grants:		
Critical Issues	200	467
Expert IPM Decision Support System	177	260
Global Change, UV-B Monitoring	1,000	1,567
Integrated Pest Management & Biological Control	2,731	2,731
Minor Crop Pest Management, IR4	8,990	10,711
Minor Use Animal Drugs	550	550
National Biological Impact Assessment Program	254	254
Pest Management Alternatives	1,623	4,200
Regional Crop Information and Policy Centers	0	1,500
Rural Development Centers	523	523
United States/Israel - Binational Ag. Research and Development (BARD)	0	2,000
Other	57,722 a/	0
Subtotal	73,770	24,763
National Research Initiative Competitive Grants:		
Natural Resources and the Environment	20,500	25,000
Nutrition, Food Safety and Health	16,000	22,000
Plants	41,000	48,000
Animals	29,000	35,000
Markets, Trade, and Rural Development	4,600	7,000
Processing for Adding Value or Developing New Products	8,200	13,000
Subtotal	119,300	150,000
Other Research:		
Critical Agricultural Materials	600 a/	0
Aquaculture Centers	4,000	4,000
Sustainable Agriculture Research and Education Program	8,000	10,500
Supplemental and Alternative Crops	750	0
1994 Research Grants	500	1,000
Federal Administration (Direct Appropriation)	14,247 a/	4,288
Subtotal	28,097	19,788
Higher Education:		
Graduate Fellowships Grants	3,000	5,000
Institution Challenge Grants	4,350	6,000
1890 Institution Capacity Building Grants	9,200	9,500
Multicultural Scholars	1,000	2,000
Hispanic Serving Institutions Education Grants Program	2,850	3,500
Tribal Colleges Education Equity Grants Program	1,552	1,552
Tribal Colleges Endowment Fund	4,600	7,100
Secondary/2-Year Post Secondary	500	500
Subtotal	27,052	35,152
Total, Research and Education Activities	486,481	467,965
Total, Cooperative State Research, Education, and Extension Service	950,196	972,395

Cooperative State Research, Education, and Extension Service ($000)

Programs	FY 2000 Appropriation Act	FY 2001 President's Budget
Integrated Activities		
Integrated Activities:		
Water Quality	$13,000	$16,204
Food Safety	15,000	15,000
Pesticide Impact Assessment	4,541	4,640
Crops at Risk from FQPA Implementation	1,000	3,000
FQPA Risk Mitigation Program for Major Food Crop Systems	4,000	10,000
Methyl Bromide Transition Program	2,000	5,000
Anti-Hunger and Food Security Grants	0	5,250
Small Farms Initiative	0	4,000
International Science and Education Grants	0	1,000
Invasive Species	0	1,500
Biobased Products	0	9,600
Organic Transition Program	0	1,000
Total, Integrated Activities	**39,541**	**76,194**
Extension Activities		
Base Programs:		
Smith-Lever Formula 3(b)&(c)	$276,548	$276,548
1890 Institutions	26,843	26,843
Subtotal	**303,391**	**303,391**
Smith-Lever 3(d) Programs:		
EFNEP	58,695	61,043
Pest Management	10,783	12,269
Farm Safety	3,400 a/	0
Rural Development Centers	908	908
Children, Youth and Families at Risk	9,000	10,000
Youth Farm Safety Education and Certification	0	5,000
Sustainable Agriculture	3,309	4,500
Pesticide Applicator Training	0	1,500
Extension Indian Reservations Program (EIRP)	1,714	5,000
Subtotal	**87,809**	**100,220**
Other Extension Programs:		
Extension Services at the 1994 Institutions	3,060	3,500
Renewable Resources Extension Act	3,192	3,192
Rural Health and Safety	2,628	0
1890 Facilities (Sec.1447)	12,000	12,000
Federal Administration:		
Other	11,886 a/	5,457
Ag in the Classroom	208	476
Subtotal	**32,974**	**24,625**
Total, Extension Activities	**424,174**	**428,236**

a/ Public Law 106-113 provided a 0.38 percent government-wide cut in the Fiscal Year 2000 appropriation. The reduction is reflected in the total.

Impacts of the Research, Extension, and Education Activities of the Land-Grant University System

Thinking Global

To help combat a shortage of bilingual veterinarians, several veterinary students at **Washington** State learned Spanish and several serve as interns in Central and South America each year. At **Arkansas**, students can earn a "trans-Atlantic" master's degree through a program developed by Arkansas and Scottish Agricultural College agricultural economists. Students from the U.S. and the United Kingdom study at each university, working or interning in the host country.

Adding Value to New and Old Agricultural Products

Virginia scientists found that corn fiber, a byproduct of the milling industry, can be converted into Xylitol, a sugar alcohol sweetener which helps prevent tooth decay and ear infections in children and acts as a safe food sweetener for diabetics. These findings could raise the value of corn fiber from 5¢ per pound to nearly $2 per pound. Research at **Colorado** found that a canola-based motor oil works just as well as the petroleum version, but without environmental drawbacks; the motor oil will be produced by a farmer-owned plant in **Michigan. Wisconsin** extension provided assistance to food-grade soybean producers in one area to improve their harvest and postharvest management skills which resulted in increased earnings.

Roadmaps to Better Crops and Animals

Iowa researchers identified two pig genes that influence litter size and developed methods to identify pigs carrying the genes. Herds improved with these pigs could help producers with 1,000-sow operations see a $20,000 annual increase in profits. In **New York**, researchers have completed genetic maps for wheat and oats that identify locations of key genes for resistance to insects and to diseases such as leaf rust and powdery mildew. These maps will cut the time and costs associated with breeding, saving U.S. cereal breeders up to $10 million per year.

Looking Out for the Small Farm

Five small farmers worked with **North Carolina A&T** extension specialists to add irrigation systems to their vegetable farms. The farmers then teamed up to buy irrigation equipment at a bargain rate and shared expenses and labor to install the systems. Each operation can expect increased sales of $2,000 to $3,000 per year from the collaboration. To beat the high cost of controlled atmospheric storage, **Minnesota** scientists developed the "Honeycrisp" apple variety, which keeps two to four times longer under normal refrigeration than other apples. Orchards are adopting the new variety at a record pace.

Safer Food

Louisiana researchers developed a method to pasteurize fresh oysters so people can still eat them raw without fear of a naturally-occurring bacterium that was linked to 69 deaths between 1992 and 1996. Under **Florida's** leadership, a national alliance of Federal, state, academic, and private organizations worked together to train, nationwide, more than 80 percent of the seafood industry and regulatory personnel in Hazard Analysis Critical Control Points methods. In **Washington,** 90 cases of food poisoning were linked to a homemade cheese called queso fresco, traditionally made with unpasteurized milk. Scientists found they could easily modify the recipe so that cheese makers could use pasteurized milk to ensure that the cheese is safe to eat. **Mississippi** researchers found that natural organic acids can extend the refrigerated shelf life of catfish fillets by six days and help control the spread of the foodborne pathogen *Listeria monocytogenes*.

Protecting Water Quality

New Mexico Extension personnel launched a homeowner education campaign about the dangers of pouring pesticides down the drain. As a result, no Diazinon contamination problems have been detected in the wastewater treatment facility in Las Cruces for the past year. **Minnesota** researchers have discovered a soil bacterium that can remove atrazine from municipal drinking water. **Alabama** A&M researchers, using remote sensing, geographic information systems, and global positioning systems, are monitoring and predicting excessive phosphorus and nitrogen levels in cotton that could adversely affect the water supply. **California** Extension personnel are helping reduce sediment that was trapping 1,300 pounds of pesticide residues in the ecosystem and harming river wildlife in the San Joaquin River and Sacramento Delta.

Healthier Lives through Research and Education

In **Georgia**, participants in Extension's Teenage Mothers Nutrition Education Program completed a year with no infant deaths compared to a statewide rate of 10 percent. Researchers in **Ohio** discovered that some cancers can be reduced or prevented by eating more canned, rather than fresh, vegetables such as carrots, spinach, and tomatoes. Apparently, effects of the canning process make it easier for the body to absorb the cancer-fighting carotenoids in these foods. **Nebraska** and **Texas** researchers found that putting hens on flax seed diets increases the ratio of good to bad cholesterol and reduces serum triglycerides, another heart disease risk factor, by 14 percent.

Pest Management

California researchers found that methyl iodide is an alternative for methyl bromide, an ozone-degrading soil fumigant that will be banned worldwide. **Maine** Extension helped potato growers adopt ecologically-beneficial farming methods, resulting in a reduction of pesticide use by 50 percent.

Local Problem Solving

Guidance from **Mississippi** Extension enabled a catfish producer to build and expand a catfish processing facility that now employs 100 people and processes 75,000 pounds of fish a day. Eighty percent of businesses that involved **Oklahoma** Extension programs to help entrepreneurs start their own businesses are still in business after four years, while the national average is only 60 percent. **Iowa** Extension helped establish 85 child-care home businesses serving 2,250 children.

Managing Agricultural Waste

In **Mississippi**, research and extension faculty helped dairy farmers meet "no discharge" wastewater requirements by finding the most affordable, efficient, and environmentally-sound ways to dispose of wastewater. **North Carolina** researchers helped the processed egg industry recover protein and fat for use as a feed additive, potentially reducing city water-treatment costs by $1 million per year.

The mission of the Cooperative State Research, Education, and Extension Service (CSREES) is to achieve significant and equitable improvements in domestic and global economic, environmental, and social conditions by advancing creative and integrated research, education, and extension programs in the food, agriculture, and related sciences in partnership with both the public and private sectors.

CSREES works in partnership with the land-grant university system, other colleges and universities, and other public and private research and education organizations, in concert with the Secretary of Agriculture and the intent of Congress, in the initiation and development of agricultural research, extension, and higher education programs. These programs are carried out by land-grant universities and other partners.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

PURPOSE STATEMENT

The Cooperative State Research, Education, and Extension Service was created by the Department Reorganization Act of 1994 which merged the former Cooperative State Research Service and the former Extension Service into a single agency. The mission of the Cooperative State Research, Education, and Extension Service (CSREES) is to benefit people, communities, and the Nation through cooperative work with agency partners and customers to advance research, extension, and higher education in the food and agricultural sciences and related environmental and human sciences.

Research and Education Activities

Research and Education programs administered by the Cooperative State Research, Education, and Extension Service are the U.S. Department of Agriculture's principal entree to the university system of the United States for the purpose of conducting agricultural research and education programs as authorized by the Hatch Act of 1887, as amended (7 U.S.C. 361a-361i); the Cooperative Forestry Research Act of 1962, as amended (16 U.S.C. 582a-7); Public Law 89-106, Section (2), as amended (7 U.S.C 450i); the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3101 et seq.); the Equity in Educational Land-Grant Status Act of 1994, (7 U.S.C. 301); and the Agricultural Research, Extension, and Education Reform Act of 1998. Through these authorities, the U.S. Department of Agriculture participates with State and other cooperators to encourage and assist the State institutions in the conduct of agricultural research and education through the State Agricultural Experiment Stations (SAES) of the 50 States and the territories; by approved Schools of Forestry; the 1890 Land-Grant Institutions and Tuskegee University; Colleges of Veterinary Medicine; and other eligible institutions. The funds appropriated provide Federal support for research and education programs at these institutions.

The State institutions conduct research and experiments on the problems continuously encountered in the development of a permanent and sustaining agriculture and forestry, and in the improvement of the economic and social welfare of rural and urban families. Because of differences in climate, soil, market outlets, and other local conditions, each State has distinct problems in the production and marketing of crops and livestock. Farmers, foresters, and rural people in the individual States naturally look to their State Agricultural Experiment Stations, universities, and colleges for solutions to the State and local problems and request services to help meet changing conditions.

Research programs at State institutions, to be most effective, include participation in regional and national programs. Joint effort by a group of State institutions is the most effective and often the only practical approach to problems of common interest. The stations form regional groups to provide cooperative, coordinated attacks on problems of regional and national interest. In a similar manner, the research programs of the State institutions and the Department of Agriculture are complementary and interdependent.

The Federal formula funds constitute a powerful force in bringing about inter-State cooperation and Federal-State collaboration in the planning and conduct of this overall program of agricultural research. Therefore, the impact of the Federal formula funds is far greater than would be expected solely on the basis of the amount of funds provided. The Administration supports a mixed portfolio of formula-based and competitive funding. Funding research competitiveness, based on merit review by peers, is uniquely suited to stimulating new research activity in specific, high priority areas.

Research at the State institutions is organized into a program of projects that is submitted for approval by CSREES. The program of projects is financed wholly or in part from Federal formula and grant funds. Programs and projects are evaluated periodically by research and education administrators, and agency and university scientific staff. The evaluation includes consideration of quality and productivity of the program

and projects. The continuing process of research evaluation by station scientists and the research and education staff results in a dynamic program with approximately 15 to 20 percent of the projects being replaced by new and/or revised projects each year.

The Department's higher education mission is carried out in strong alliance with States, universities, and the private sector. Recognizing the significance of this alliance, the Food and Agriculture Act of 1977 designated USDA as the lead Federal agency for higher education in the food and agricultural sciences. Through the CSREES Office of Higher Education Programs, USDA has implemented that charge with a broad array of initiatives to link teaching, research, and extension and improve the training of food and agricultural scientists and professionals. Most of these efforts were informal until 1984, when the Department initiated the National Needs Graduate Fellowships Grants Program to develop expertise in areas with scientific shortages. This role was expanded significantly in recent years by implementation of the Higher Education Challenge Grants Program, the 1890 Institution Teaching and Research Capacity Building Grants Program, Multicultural Scholars Program, Tribal Colleges Equity Program, Native American Endowment Fund, Hispanic Serving Institutions Education Grants Program, and the Secondary Program Education Program, all of which are intended to strengthen the quality of education programs throughout the nation.

Appropriations for research and education activities are authorized under the following Acts:

1. Payments to agricultural experiment stations under the Hatch Act Agricultural Experiment Stations Act of August 11, 1955, Hatch Act of 1887 as amended - 7 U.S.C. 361a-361i, Public Law 92-318; Public Law 93-471; Public Law 95-113, as amended; Public Law 95-134; Public Law 96-205; Public Law 96-374; Public Law 96-597; Public Law 97-98; Public Law 98-213; Public Law 98-454; Public Law 99-198; Public Law 99-396; Public Law 101-624; Public Law 104-127; and Public Law 105-185.

Funds under the Hatch Act are allocated to the State Agricultural Experiment Stations of the 50 States, District of Columbia, Puerto Rico, Guam, the Virgin Islands, Micronesia, American Samoa, and Northern Mariana Islands for research to promote a sound and prosperous agriculture and rural life.

The foundation of the Federal-State partnership in agricultural research is provided jointly through formula Hatch funding and matching State revenue. Hatch funding provides sustained research activities in agricultural priority areas to address pre-commercial and/or non-funded technologies of public need. Hatch funded research is complementary to ARS National Research Programs and State-based research, addressing technology gaps through coordinated programs. This mixed portfolio of activities completes a well-rounded national agricultural research agenda that has, for the past century, allowed U.S. agriculture to become the envy of the rest of the world.

In accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185, eligible State institutions are required to submit a five-year Plan of Work to CSREES for approval before Hatch Act funds are distributed. The Hatch Act provides that the distribution of Federal payments to States for fiscal year 1955 shall become a fixed base and that any sums appropriated in excess of the 1955 level shall be distributed in the following manner:

- 20% percent shall be allotted equally to each State.
- not less than 52% shall be allotted to the States as follows: one-half in an amount proportionate to the relative rural population of each State to the total rural population of all States, and one-half in an amount proportionate to the relative farm population of each State to the total farm population of all States.
- not less than 25 % shall be used for multi-State, multi-disciplinary, multi-institutional research activities to solve problems concerning more than one state.
- 3% shall be available to the Secretary of Agriculture for the administration of this Act.

Federal funds provided under the Hatch Act to State institutions must be matched with non-Federal funding on a dollar-for-dollar basis. Matching requirements for the Commonwealth of Puerto Rico, the Virgin Islands, and Guam are subject to the same matching requirements as those applicable to an eligible institution under Section 1449 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3222d).

In accordance with provisions o the Agricultural Research, Extension, and Education Reform Act of 1998, States must use up to 25 percent of Hatch Act funds for activities that integrate cooperative research and extension.

The three percent of funds appropriated under the Hatch Act for administration includes disbursement of funds and a continuous review and evaluation of the research programs of the SAES supported wholly or in part from Hatch funds. CSREES encourages and assists in the establishment of cooperation within and between the States, and also actively participates in the planning and coordination of research programs between the States and the Department at the regional and national levels.

2. Cooperative Forestry Research - (McIntire-Stennis) - The Cooperative Forestry Research Act of October 10, 1962, 16 U.S.C. 582a-7; Public Law 96-374; Public Law 97-98; Public Law 99-198; Public Law 101-624; Public Law 104-127.

The Act authorizes funding of research in State institutions certified by a State representative designated by the governor of each State. The Act provides that appropriated funds be apportioned among States as determined by the Secretary after consultation with the legislatively mandated Forestry Research Advisory Council. The Council consists of not fewer than sixteen members representing Federal and State agencies concerned with developing and utilizing the Nation's forest resources, the forest industries, the forestry schools of the State-certified eligible institutions, SAES, and volunteer public groups concerned with forests and related natural resources. Determination of apportionments follows consideration of pertinent factors including areas of non-Federal commercial forest land, volume of timber cut from growing stock, and the non-Federal dollars expended on forestry research in the State. The Act also provides that payments must be matched by funds made available and budgeted from non-Federal sources by the certified institutions for expenditure for forestry research. Three percent of funds appropriated under this Act is set-aside for Federal administration.

The public benefits from the McIntire-Stennis Program in two major ways, as intended by Congress - by the solution of forestry and related resource problems through research and development, and by the provision of a continuing cadre of forestry research leaders for the Nation through involvement in forestry research while graduate students.

3. Payments to 1890 Colleges and Tuskegee University - The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1445, Public Law 95-113; Public Law 95-547; Public Law 97-98; Public Law 99-198; Public Law 101-624; Public Law 104-127; and Public Law 105-185. Public Law 95-113, as amended, provides for support of continuing agricultural research at colleges eligible to receive funds under the Act of August 30, 1890, including Tuskegee University. The fiscal year 2000 Appropriations Act, Public Law 106-78, provided funds to West Virginia State College under this program. In accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185, eligible State institutions are required to submit a Plan of Work to CSREES for approval before these formula funds are distributed. The agricultural research programs at the 1890 Land-Grant Colleges and Universities are designed to generate new knowledge which will assist rural underprivileged people and small farmers obtain a higher standard of living. Therefore, there is a high concentration of research effort in the areas of small farms, sustainable agriculture, rural economic development, human nutrition, rural health, and youth and elderly. Beginning with fiscal year 1979, there shall be appropriated funds for each fiscal year, an amount

not less than 15 percent of the total for such year under Section 3 of the Act of March 2, 1887. Distribution of payments made available under section 2 of the Act of August 4, 1965, for fiscal year 1978 are a fixed base and sums in excess of the 1978 level shall be distributed as follows:

- 3% shall be available to the Secretary of Agriculture for administrative costs.
- Payments to States in fiscal year 1978 are a fixed base. Of funds in excess of this amount:
- 20% shall be allotted equally to each state.
- 40% shall be allotted in an amount proportionate to the rural population of the State in which the eligible institution is located to the total rural population of all States in which eligible institutions are located, and
- 40% shall be allotted in an amount proportionate to the farm population of all the States in which eligible institutions are located.

Federal funds provided under Payments to 1890 Colleges and Tuskegee University must be matched in accordance with Section 226 of the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185 (7 U.S.C. 3222d).

Allotments to Tuskegee University and Alabama A&M University shall be determined as if each institution were in a separate State. Three percent of the funds appropriated under this Act is set-aside for Federal administration.

4. Special Research Grants - Section 2(c), Act of August 4, 1965, 7 U.S.C. 450i(c), as amended by Public Law 95-113; Public Law 97-98; Public Law 98-284; Public Law 99-198; Public Law 101-624; Public Law 104-127; and Public Law 105-185.

Section 2(c) of the Act of August 4, 1965, as amended, authorizes Special Research Grants for periods not to exceed three years to State Agricultural Experiment Stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals. Previously, grants were made available for the purpose of conducting research to facilitate or expand promising breakthroughs in areas of the food and agricultural sciences. However, the Agricultural Research, Extension, and Education Reform Act of 1998 expanded the purposes under this authority to include extension or education activities. Special Research Grants are awarded on discretionary basis as well as through the use of competitive scientific peer and merit review processes. Projects have included applied research and technology transfer studies that primarily focus on rural and economic development, environmental protection, enhanced agricultural productivity, integrated pest management, and biotechnology. Four percent of funds appropriated for this program is set-aside for Federal Administration.

Research grants are also awarded under the Critical Agricultural Materials Act, Public Law 98-284, as amended. Grants are awarded to aquaculture centers under section 1475(d) of Public Law 95-113, as amended. Grants for supplemental and alternative crops are awarded under section 1473D of Public Law 95-113, as amended. Grants for sustainable agriculture research and education are awarded under section 1621 of Public Law 101-624. Four percent of funds appropriated for these programs is set-aside for Federal administration.

5. National Research Initiative Competitive Grants - Section 2(b), Act of August 4, 1965, 7 U.S.C. 450i(b), as amended by Public Law 95-113; Public Law 97-98; Public Law 99-198; Public Law 101-624; Public Law 104-127.

Section 2(b) of the Act of August 4, 1965, as amended, authorizes Competitive Research Grants for periods not to exceed five years to State Agricultural Experiment Stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals to further the programs of the Department of Agriculture. The purpose of the National Research Initiative Competitive Grants Program (NRICGP) is to support research with the greatest potential of

expanding the knowledge base needed to solve current problems as well as meet unforeseen issues that will face the future agricultural and forestry enterprise. The NRICGP also was established to increase the proportion of research funds that the USDA distributes through competitive peer review, and to offer funding for fundamental and mission-oriented research in biological, physical, and social science areas that have national impact and are unlikely to be funded at the local or regional level. By obtaining the participation of outstanding researchers in the entire U.S. scientific community, emphasis will be placed on research in the areas of natural resources and the environment; nutrition, food safety, and health; plants; animals; markets, trade and rural development; and processing for adding value or developing new products. Four percent of funds appropriated for this program is set-aside for Federal administration.

6. Animal Health and Disease Research - The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1433, Public Law 95-113; Public Law 97-98; Public Law 99-198; Public Law 101-624; Public Law 104-127.

Section 1433 provides for support of livestock and poultry disease research in accredited schools or colleges of veterinary medicine or State Agricultural Experiment Stations that conduct animal health and disease research. These funds provide support for new research initiatives and enhance research capacity leading to improved animal health, reduced use of antibacterial drugs and improved safety of foods of animal origin. These funds shall be distributed as follows:

- 4% shall be retained by the Department of Agriculture for administration, program assistance to the eligible institutions, and program coordination.
- Forty eight percent shall be distributed in an amount proportionate to the value of and income to producers from domestic livestock and poultry in each State to the total value of and income to producers from domestic livestock and poultry in all the states.
- 40% percent shall be distributed in an amount proportionate to the animal health research capacity of the eligible institutions in each State to the total animal health research capacity in all the States.

Eligible institutions must provide non-Federal matching funds in States receiving annual amounts in excess of $100,000 under this authorization.

7. 1994 Institutions Research - The Equity in Educational Land-Grant Status Act of 1994, Public Law 103-382, as amended, authorizes a competitive research grants program for the thirty institutions designated as 1994 Institutions. The program allows scientists at the 1994 Institutions to participate in basic and applied research activities that address tribal, National, and multi-state priorities.

8. Federal Administration (direct appropriation) - Authority for direct appropriations is provided in the annual Agriculture, Rural Development, Food and Drug Administration and Related Agencies Appropriations Act. These funds are used to provide support services in connection with planning and coordination of all research and education programs administered by Cooperative State Research, Education, and Extension Service, including the Research, Education, and Economics Data Information System. Research grant programs are also included within direct federal administration.

9. Higher Education - The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1417, Public Law 95-113; Agricultural Public Law 97-98; Public Law 99-198; Second Morrill Act of 1890; Public Law 100-339; Public Law 101-624; Public Law 103-382; Public Law 104-127; and Public Law 105-185.

Higher Education-Graduate Fellowships Grants pursuant to Section 1417(b)(6) are awarded on a competitive basis to colleges and universities to conduct graduate training programs to stimulate the development of food and agricultural scientific expertise in targeted national need areas. This program strengthens higher education in the food and agricultural sciences by producing graduates capable of fulfilling the Nation's requirements for professional and scientific expertise. The program is designed to attract highly promising

individuals to research or teaching careers in areas of the food and agricultural sciences where shortages of expertise exist. Typically graduate students in the food and agricultural sciences require a minimum of four years to complete a doctoral degree. The USDA fellowships program provides support for doctoral study for three years, and the universities are expected to support the student's fourth year of dissertation research. Four percent of funds appropriated for this program is set-aside for Federal administration.

Institution Challenge Grants pursuant to Section 1417(b)(1) are designed to stimulate and enable colleges and universities to provide the quality of education necessary to produce graduates capable of strengthening the Nation's food and agricultural scientific and professional work force. The program is designed to strengthen institutional capacities, including curriculum, faculty, scientific instrumentation, instruction delivery systems, and student recruitment and retention, to respond to identified state, regional, national, or international educational needs in the food and agricultural sciences. All Federal funds competitively awarded under this program must be matched by the universities on a dollar-for-dollar basis from non-Federal sources. Four percent of funds appropriated for this program is set-aside for Federal administration.

The Higher Education Multicultural Scholars Program pursuant to Section 1417(b)(5) will increase the ethnic and cultural diversity of the food and agricultural scientific and professional work force and advance the educational achievement of minority Americans. The public purpose of this program is to meet national and international needs for training food and agricultural scientists and professionals. This competitive program is designed to help the food and agricultural scientific and professional work force achieve full participation by members of traditionally underrepresented racial and ethnic groups. It is open to all colleges and universities with baccalaureate or higher degrees in Agriculture, Forestry, Natural Resources, Home Economics, Veterinary Medicine, and closely allied fields. Federal funds provide 75 percent of the four-year scholarship awards; the remaining 25 percent is contributed by the grantee institutions. Four percent of funds appropriated for this program is set-aside for Federal administration.

The 1890 Institution Teaching and Research Capacity Building Grants Program pursuant to 1417(b)(4) stimulates the development of high quality teaching and research programs at the 1890 Land-Grant Institutions and Tuskegee University to build their capabilities as full partners in the mission of the Department to provide more, and better trained, professionals for careers in the food and agricultural sciences. This competitive program is designed to strengthen institutional teaching and research capacities, through cooperative programs with Federal and non-Federal entities, including curriculum, faculty, scientific instrumentation, instruction delivery systems, student experimental learning, student recruitment and retention, studies and experimentation, centralized research support systems, and technology delivery systems, to respond to identified State, regional, national, or international educational needs in the food and agricultural sciences.

The USDA-Hispanic Serving Institutions Education Partnerships Grants Program pursuant to Section 1417(b)(4) will be the foundation for USDA efforts to better serve Hispanic Americans and to prepare them for careers in agriscience and agribusiness. This competitive program will expand and strengthen academic programs in the food and agricultural sciences at Hispanic-serving colleges and universities, including two-year community colleges, that have at least twenty-five percent Hispanic enrollment. Four percent of funds appropriated for this program is set-aside for Federal administration.

The Tribal Colleges Education Equity Grants Program - The Equity in Educational Land-Grant Status Act of 1994, Public Law 103-382, as amended, authorizes the use of funds to benefit those entities identified as the 1994 Land Grant Institutions. Each of the 30 institutions receives approximately $50,000. Funds may be used to support teaching programs in the food and agricultural sciences in the targeted need areas of : 1) curricula design and instructional materials development; 2) faculty development and preparation for teaching; 3) instruction delivery systems; 4) student experimental learning; 5) equipment and instrumentation for teaching, and; 6) student recruitment and retention.

10. The Native American Institutions Endowment Fund, authorized by Public Law 103-382, as amended, provides for five payments of $4.6 million for each fiscal year 1996 to 2002 to establish an endowment for the 1994 land-grant institutions (30 Tribally-controlled colleges). The fiscal year 2001 budget proposes increasing the endowment to $7.1 million in 2001 and 2002. The interest derived from the endowment is distributed to the 1994 land-grant institutions on a formula basis. This program will enhance educational opportunities for Native Americans by building educational capacity at these institutions. Institutions will be encouraged to use the increased funding in 2001 and 2002 for facility renovation and construction. On the termination of each fiscal year, the Secretary shall withdraw the income from the endowment fund for the fiscal year, and after making adjustments for the cost of administering the endowment fund, at 4 percent, distribute the adjusted income as follows. Sixty percent of the adjusted income from these funds shall be distributed among the 1994 Institutions on a pro rata basis, the proportionate share being based on the Indian student count. Forty percent of the adjusted income shall be distributed in equal shares to the 1994 Institutions.

11. The Secondary Agriculture Education Challenge Grants Program, authorized by Sec. 1417(j) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3152 (j)), is designed to promote and strengthen secondary education in agribusiness and agriscience and to increase the number and/or diversity of young Americans pursuing college degrees in the food and agricultural sciences. The intent of the program is to encourage teachers to creatively incorporate elements of agriscience and agribusiness into secondary education programs. Proposals address targeted need areas of curricula design and instructional materials development; faculty development and preparation for teaching; career awareness; linkages between secondary, 2-year post-secondary, and institutions of higher learning; or education activities promoting diversity in students seeking degrees in agribusiness and agriscience. Awards are made on a competitive basis.

Extension Activities

The Cooperative Extension System (CES), a national educational network, is a dynamic organization pledged to meeting the country's needs for results of research, knowledge and educational programs that will enable people to make practical decisions. Its mission is to help people improve their lives through an educational process that uses scientific knowledge focused on issues and needs. Cooperative Extension work was established by the Smith-Lever Act of May 8, 1914, as amended. This work is further emphasized in Title XIV (National Agricultural Research, Extension, and Teaching Policy) of the Food and Agriculture Act of 1977, as amended. To accomplish its mission, the Cooperative Extension System is constantly changing to meet the shifting needs and priorities of the people it serves. To fulfill the requirements of the Smith-Lever Act, the Cooperative Extension Service in each state, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, the Northern Marianas and Micronesia, conduct educational programs to improve American agriculture, communities of all sizes, and strengthen families throughout the Nation. This publicly funded, out-of-the classroom educational network combines the expertise and resources of Federal, state and local partners. The partners in this unique System are:

- o The Cooperative State Research, Education, and Extension Service of the U.S. Department of Agriculture (USDA);
- o Cooperative Extension Services at land-grant universities throughout the United States and its territories; and
- o Cooperative Extension Services in nearly all of the Nation's 3,150 counties.

Thousands of Extension employees and nearly 3 million volunteers support this partnership and magnify its impact. Strong linkages with both public and private external groups are also crucial to the Extension System's strength and vitality.

Cooperative Extension work is comprised of Base Programs which are the major educational efforts central to the mission of the System and common to most Extension units. They are the ongoing priority efforts of the System, involving many discipline-based and multi-disciplinary programs. The system's base programs are the foundation of the Extension organization. Base programs include Smith-Lever Formula 3(b&c), 1890 Institutions, and D.C. Extension.

National initiatives are the system's commitment to respond to important problems of broad national concern with additional resources and significantly increased effort to achieve a major impact on national priorities. They are the current most significant and complex issues on which the Extension System has the potential to make a difference--usually in cooperation with other agencies, groups and units of government. Current National Initiatives are:

- Food Quality and Safety
- Child Care
- Healthy People . . . Healthy Communities
- Animal Waste Management
- Workforce Preparation

10. Smith-Lever 3 (b) & (c) formula funds of the Smith-Lever Act of 1914, 38 STAT 372, 7 U.S.C. 343 (b)(3), as amended, comprise approximately 65% of the total fiscal year 2000 Federal funding for extension activities. These funds are allocated to the States on the basis of the rural and farm population of each State and the territories. The core of the State Extension Service programs is financed from these sources because of its discretionary nature. States can utilize funds for locally determined programs, as well as for high priority regional and national concerns.

Formula funding permits a consistent, stable, dependable, and reliable programming source for State and county Extension cooperators and allows maximum flexibility in addressing national, regional, and local problems and issues. In accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185, eligible State institutions are required to submit a Plan of Work to CSREES for approval before Smith-Lever 3 (b) & (c) formula funds are distributed. The formula distribution is:

- 16% shall be divided equally among the States.
- 40% shall be paid to the several States in the proportion that the rural population of each bears to the total rural population of the several States as determined by the census.
- 40% shall be paid to the several States in the proportion that the farm population of each bears to the total farm population of the several States as determined by the census.
- 4% shall be allotted for Federal administrative, technical, and other services, and for coordinating the extension work of the Department and the several States, Territories, and possessions.

States must expend 25%, or two times the level spent in fiscal year 1997 (whichever is less), on cooperative extension activities in which two or more States cooperate to solve problems that concern more than one State.

States must expend up to 25% of Smith-Lever 3(b) and (c) funds for activities that integrate cooperative research and extension.

Smith-Lever 3(b) and (c) funding provided to an 1862 Land-Grant Institution must be matched with non-Federal funding on a dollar-for-dollar basis.

11. Smith-Lever 3(d) - These earmarked or targeted funds are allocated to the States to address special programs or concerns of regional and national importance and are primarily distributed according to the extent of the problem that requires attention in each State.

The following Extension programs are supported under the Smith-Lever 3(d) funding mechanism and other specific authorizations:

Expanded Food and Nutrition Education Program (EFNEP) - Public Law 101-624, Section 1776, 7 U.S.C. 3175 - Funds are used to provide low-income families information to increase nutrition knowledge and improve nutritional practices. Generally, EFNEP funds are distributed to the States and territories on the basis of a poverty level formula of all the States whose population is living at or below 125% of the poverty level. Provisions are made for base funding to all States.

Pest Management - Public Law 101-624, Section 1650, 7 U.S.C. 5881 - This program consists of two major components: integrated pest management (IPM) and cotton pest management. IPM, active in all States as well as Guam, Puerto Rico and the Virgin Islands, addresses the efficient control of pest complexes on crops and livestock and in urban situations. Cotton pest management focuses on cotton insects and is an earmarked program in 11 States. Funds are distributed on the basis of a formula using boll weevil losses and pesticide sales in each State.

The Cooperative Extension System (CES) has established strong Integrated Pest Management (IPM) programs in each State and territory of the United States. Every CES IPM program strives to educate users of pesticides about the economic and environmental benefits of an IPM approach to pest management. The goals of these programs are to 1) minimize the impact of agriculture on the environment; i.e., application of pesticides and soil erosion, and 2) maintain the profitability and international competitiveness of U.S. agriculture. The critical issues of water quality, endangered species, food safety, and farm worker safety are important elements of CES IPM programs. CES programs also educate homeowners and urban pest control professionals about IPM strategies for the lawn, garden, home and commercial structures.

Farm Safety - The Rural Health and Safety Education Act of 1990, 7 U.S.C. 2661, Public Law 101-624, Section 2390 - This program provides farm and ranch residents in all the States with information to assist in reducing and preventing agricultural related work incidents. These funds are equally distributed to the 50 States and Puerto Rico. Additionally, Extension works with States and the National Easter Seal Society in conducting AgriAbility projects designed to assist farmers with disabilities to stay in farming.

Rural Development Centers - This program provides funds at four regional centers in Pennsylvania, Mississippi, Oregon, and Iowa, and a center in North Dakota. Programs are designed to improve the social and economic well-being of rural communities in their respective regions. These funds are distributed according to the extent of the problem that requires attention in each state.

Children, Youth, & Families At Risk - This program focuses on America's children, youth and families to help promote and provide positive, productive, secure environments and contributions to communities and the Nation. Projects are distributed to each State and awarded competitively to focus on child care, science and reading literacy and building program and community capacity.

Indian Reservations - Public Law 101-624, Section 1677, 7 U.S.C. 5930 - Projects are funded at various Indian Reservations and State Extension Services. Focus is on providing assistance and educational programs in agriculture, community development, families and societal issues facing Native Americans. Projects are competitively awarded.

Sustainable Agriculture - Public Law 101-624, Section 1629, 7 U.S.C. 5832 - Smith-Lever 3(d) funding for sustainable agriculture programs was initially provided in the FY 1994 Appropriations for Extension Service. These funds are used to address the activities described in Chapter 3 of Subtitle B of the FACT Act of 1990. The purpose is to provide education and training for CES agents, and other professionals in the university system or other government agencies, involved in the education and transfer of technical information concerning sustainable agriculture. Funds are used for statewide planning of sustainable agriculture programs and competitively awarded projects on a regional basis.

12. Payments to 1890 Colleges and Tuskegee University - The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Section 1444, 7 U.S.C. 321-326 and 328.

Public Law 95-113, as amended, provides support to the 1890 Land-Grant Colleges and Universities for fostering, developing, implementing and improving extension educational programs to benefit their clientele. The fiscal year 2000 Appropriations Act, Pub. L. 106-78, provided funds for West Virginia State College under this program. In accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 1015-185, eligible State institutions are required to submit a five-year Plan of Work to CSREES for approval before these formula funds are distributed. Beginning with the fiscal year ending September 30, 1982, there shall be appropriated under this section an amount not less than 5 1/2 per centum, and each fiscal year thereafter, an amount not less than 6 per centum of the total appropriations for such year under the Act of May 8, 1914, and related acts pertaining to cooperative extension work at the land-grant institutions identified in the Act. Payments for the fiscal year ending September 30, 1978, shall be distributed as follows:

- 4% shall be allotted for administrative, technical, and other services.
- Payments to States in fiscal year 1978 are a fixed base. Of funds in excess of this amount:
- 20% shall be allotted equally to each State.
- 40% shall be allotted in an amount proportionate to the rural population of the State in which the eligible institution is located to the total rural population of all States in which eligible institutions are located, and
- 40% shall be allotted in an amount proportionate to the farm population of all States in which eligible institutions are allocated.

Federal funds provided under Payments to 1890 Colleges and Tuskegee University must be matched in accordance with Section 226 of the Agricultural Research, Extension, and Education Reform Act of 1998, Public Law 105-185 (7 U.S.C. 3222d).

Allotments to Tuskegee Institute and Alabama A&M shall be determined as if each institution were in a separate State. Four percent of the funds appropriated under this Act is set-aside for Federal Administration.

13. The Renewable Resources Extension Act - Renewable Resources Extension Act of 1978, 16 U.S.C. 1671, Amended Section 5A. 16 U.S.C. 167a. - Provides funding for expanded natural resources education programs. Funds are distributed by formula to all States for educational programs.

14. Rural Health and Safety - Rural Health and Safety Education Act of 1990, Public Law 101-624, Section 2390, 7 U.S.C. 2661 - This program helps rural residents avoid the numerous obstacles to maintaining their health status. This project maintains the ongoing rural health projects in Mississippi and Louisiana that focus on training health care professionals in rural areas.

16. 1890 Facilities (Sec. 1447) - The National Agricultural Research, Extension, and Teaching Policy Act of 1977, Public Law 95-113, 7 U.S.C. 32225 - These funds provide facilities improvement programs at the 1890 Institutions under Section 1447 of the FACT Act.

17. Extension Services at the 1994 Institutions - The Equity in Education Land-Grant Status Act of 1994 (section 534 of Public Law 103-382), as amended, authorizes appropriations for Native American communities and Tribal Colleges for extension activities as set forth in the Smith Lever Act. Funding under this program, initially provided by Congress in fiscal year 1997, will be awarded on a competitive basis.

18. Federal Administration (Direct Appropriation) - Provides a portion of the general operating funds for the Federal staff, and national program planning, coordination, and program leadership for the extension work in partnership with the states and territories.

Integrated Activities

The following programs are included under the integrated activities account:

1. Small Farms Initiative - Section 406 of Public Law 105-185 - This program supports recommendations made by the USDA National Commission on Small Farms. It also supports the three goals of the National Small Farm Program: enhance the economic viability of small farms; improve the contribution of small farms to environmental quality; and enrich the quality of life for small farm families. These funds will be provided under competitive awards.

2. Water Quality - Section 406 of Public Law 105-185 - This program assists the State Agricultural Experiment Stations and the Cooperative Extension System to become viable partners with other State and Federal agencies in addressing water quality problems of National importance. These funds will be provided under competitive awards.

3. Food Safety - Section 406 of Public Law 105-185 - This program provides for research, extension, and education programs to improve the safety of food products and to create a public that is more informed about food safety issues. These funds will be provided under competitive awards.

4. Pesticide Impact Assessment (PIA) - Section 406 of Public Law 105-185 - This program provides for the most objective and accurate data available for defining and evaluating benefits and risks of selected pesticides having critical agricultural and forestry uses. These funds will be provided under competitive awards.

5. Crops at Risk from FQPA Implementation - Section 406 of Public Law 105-185 - This program is an intermediate-term research and extension program with the at-risk cropping system as the focal point. Development of new multiple-tactic IPM strategies designed to assist in the transition period for certain pesticides affected by the implementation of the Food Quality Protection Act of 1996 (FQPA) will be the goal of the program. These funds will be provided under competitive awards.

6. FQPA Risk Mitigation Program for Major Food Crop Systems - Section 406 of Public Law 105-185 - This program will emphasize development and implementation of new and innovative pest management systems designed to maintain the productivity and profitability of major acreage crops while meeting or exceeding environmental quality and human health standards as the Food Quality Protection Act of 1996 (FQPA) is implemented. These funds will be provided under competitive awards.

7. Methyl Bromide Transitions Program - Section 406 of Public Law 105-185 - This program is designed to support the discovery and implementation of practical pest management alternatives for commodities affected by the methyl bromide phase-out. The program will focus on short- to medium-term solutions for all commodities at risk using either combinations of presently available technologies or some newly developed practices. These funds will be provided under competitive awards.

8. Biobased Products - Section 406 of Public Law 105-185 - This program will help increase economic opportunities for U.S. farmers by developing and expanding markets through research, development, and commercialization of new, economically competitive and environmentally preferable products from biobased resources. These funds will be provided under competitive awards.

9. International Science and Education - Section 229 of Public Law 105-185 - This program will support globalization of colleges and universities to strengthen U.S. economic competitiveness and to promote international market development for U.S. agriculture. These funds will be provided under competitive awards.

10. Invasive Species - Section 406 of Public Law 105-185 - This program supports integrated research, extension, and education activities at a local level to address invasive species issues on an ecoregional basis. The program targets invasive species through an ecosystem-centered, collaborative process that prioritizes investment needs, based on analysis of risk and potential economic return for research, education, and extension programs. These funds will be provided under competitive awards.

11. Organic Transition Program - Section 406 of Public Law 105-185 - This program supports the development and implementation of biologically based pest management practices that mitigate the ecological, agronomic and economic risks associated with a transition from conventional to organic agricultural production systems. These funds will be provided under competitive awards.

12. Anti-Hunger and Food Security Grants Program - Section 25 of the Food Stamp Act of 1977, as amended - These funds will be provided under competitive awards to non-profit entities for projects that reduce hunger, improve nutrition, bolster community food security, and help families move from poverty to self-sufficiency.

For the Cooperative State Research, Education, and Extension Service, program coordination and planning are carried out by staff located entirely in the Washington, D.C. area. As of September 30, 1999, there were 395 full time employees.

Agency Audit Reports

Cooperative State Research, Education, and Extension Service

OMB Circular A-133 Audits

Cold Spring Harbor Laboratory (New York), for the Fiscal Year Ended December 31, 1997

State of Kansas, for the Fiscal Year Ended June 30, 1997

Cornell University (New York), for the Fiscal Year Ended June 30, 1997

Ohio State University, for the Fiscal Years Ended June 30, 1997 and June 30, 1998

Lincoln University (Missouri), for the Fiscal Year Ended June 30, 1998

University of Georgia, for the fiscal Year Ended June 30, 1998

State of Nebraska, for the Fiscal Year Ended June 30, 1998

University of Hawaii, for the Fiscal Year Ended June 30, 1997

State of Texas, for the Fiscal Year Ended August 31, 1998

State of Mississippi, for the Fiscal Year Ended June 30, 1998

Jefferson University (Pennsylvania), for the Fiscal Years Ended June 30, 1997 and June 30, 1998

University of Illinois, for the Fiscal Year Ended June 30, 1997

Marine Biological Laboratory (Massachusetts), for the Fiscal Year Ended December 31, 1997

State of Tennessee, for the Fiscal Year Ended June 30, 1997

General Hospital Corporation (Massachusetts), for the Fiscal Year Ended September 30, 1997

State of Wisconsin, for the Fiscal Year Ended June 30, 1997

State of Georgia, for the Fiscal Year Ended June 30, 1998

University of Minnesota, for the Fiscal Year Ended June 30, 1998

Missouri Botanical Garden, for the Fiscal Years Ended December 31, 1996 and December 31, 1997

Missouri Botanical Garden, for the Fiscal Year Ended December 31, 1998

University of Arkansas for Medical Sciences, for the Fiscal Year Ended June 30, 1998

Tuskegee University (Alabama) for the Fiscal Year Ended June 30, 1997

Tuskegee University (Alabama) for the Fiscal Year Ended June 30, 1998

Children's Hospital and Regional Medical Center (Washington), for the Fiscal Year Ended September 30, 1998

St. Mary's College of Maryland, for the Fiscal Year Ended June 30, 1998

Oberlin College (Ohio), for the Fiscal Years Ended June 30, 1997 and June 30, 1998

State of Arizona, for the Fiscal Year Ended June 30, 1997

Institute of Ecosystem Studies, Inc. (New York), for the Fiscal Year Ended June 30, 1997

Rural Enterprises of Oklahoma, Inc., for Fiscal Years Ended December 31, 1997 and December 31, 1998

Amherst College (Massachusetts), for the Fiscal Year Ended June 30, 1998

Vermont State Colleges, for the Fiscal Years Ended June 30, 1997 and June 30, 1998

State of Minnesota, for the Fiscal Years Ended June 30, 1997 and June 30, 1998

State of Rhode Island, for the Fiscal Year Ended June 30, 1998

Commonwealth of Virginia, for the Fiscal Year Ended June 30, 1998

Office of Inspector General Initiated Audits

13011-1-Te	Use of Grant Funds by Langston University (Oklahoma)
13601-1-At	National Research Initiative Competitive Grants Program - Fiscal Years 1993 through 1996
13011-2-Te	Adequacy of CSREES Assurances Over Appropriate Use of Funds Provided to Prairie View A&M University (Texas)

50601-5-At	Managing Facilities Construction Grants
13011-1-Ch	Use of 4-H Program Funds - University of Illinois
13011-2-At	Review of Extension Grants Awarded to South Carolina State University
13099-1-Te	National Center for Resource Innovations (Virginia)

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

Available Funds and Staff-Years

1999 Actual and Estimated, 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Direct Appropriations:						
Research and Education Activities	485,816,000	187	486,481,000	202	467,965,000	207
Extension Activities	437,987,000	193	424,174,000	210	428,236,000	205
Buildings and Facilities	--	1	--	1	--	--
Integrated Activities	--	--	39,541,000	8	76,194,000	10
Initiative for Future Agriculture and Food Systems	--	--	120,000,000	10	120,000,000	20
Fund for Rural America	--	--	20,000,000	(6)	(a)	(12)
Total, Direct Appropriations	923,803,000	381	1,090,196,000	431	1,092,395,000	442
Obligations under other USDA appropriations:						
Research and Education Activities:						
Agricultural Research Service:						
Biotech. Risk Assessment	783,220	--	783,220	--	783,220	--
Sal/Ben. & Operating Expenses for Detailees	80,616	--	--	--	--	--
REE Operating Expenses	13,320	--	14,000	--	14,000	--
Strategic Planning Task Force on Research Facilities	25,620	--	--	--	--	--
Shared Cost of NAREEE Advisory Board	126,000	--	126,000	--	126,000	--
Food Safety Research Needs Conference	7,951	--	--	--	--	--
Working Group on Water Quality Travel Expenses	4,057	--	--	--	--	--
Biotechnology Risk Assessment Review	12,000	--	--	--	--	--
12th Annual Symposium for Assoc. of Research Directors	--	--	10,000	--	--	--
Animal and Plant Health Inspection Service:		--	--	--	--	--
Citrus Canker Project	127,344	--	--	--	--	--
Economic Research Service:						
REE Operating Expenses	7,160	--	6,400	--	6,400	--
Shared Cost of NAREEE Advisory Board	31,500	--	34,500	--	34,500	--
Foreign Agricultural Service:						
NAFEO Career Fair	2,500	--	--	--	--	--
Forest Service:						
Agroforestry Practices on Farms/SARE	50,000	--	50,000	--	50,000	--
Biotech. Risk Assessment	68,000	--	68,000	--	68,000	--
Atmospheric Deposition	144,966	--	144,966	--	144,966	--
Strategic Planning Task Force on Research Facilities	19,215	--	--	--	--	--
National Agricultural Statistics Service:						
REE Operating Expenses	6,000	--	5,200	--	5,200	--
Shared Cost of NAREEE Advisory Board	31,500	--	31,500	--	31,500	--
National Food and Agriculture Council:						
Pilot Information Technologies Project	205,000	--	--	--	--	--
Natural Resources Conservation Service:						
Minority On-Line Information System(MOLIS)	35,000	--	35,000	--	35,000	--
Office of Chief Financial Officer:						
Hispanic Association of Colleges and Universities Leadership Group	873,700	--	873,700	--	873,700	--
Risk Management Agency:						
Whole Farm Revenue Safety Concept	283,231	--	283,231	--	283,231	--
Risk Management Projects	73,964	--	73,964	--	73,964	--
Estimating and Updating Crop Yield Distributions	107,065	--	107,065	--	107,065	--
Yield Performance and Producer Experience	48,913	--	48,913	--	48,913	--
World Agricultural Outlook Board:						
National Drought Mitigation Center	15,000	--	15,000	--	15,000	--
South Africa Ag. Weather and Climate Project	15,000	--	15,000	--	15,000	--
Various agencies sharing cost of the USDA Small Business Innovation Research Program (SBIR)	2,213,713	--	2,466,446	--	1,971,521	--
Various research agencies sharing cost of the Current Research Information System (CRIS)	772,998	9	772,998	9	772,998	9
Various agencies sharing cost of the Community Food Initiative	255,000	--	255,000	--	0	--
Various agencies sharing cost of the Hispanic Association of Colleges and Universities Summer/Fall Internship Program	948,180	--	948,180	--	948,180	--
Other Anticipated Reimbursements	--	--	924,232	--	1,684,157	--
Subtotal, Res./Ed. Other USDA Appropriations	7,387,733	9	8,092,515	9	8,092,515	9

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Extension Activities:						
Agricultural Marketing Service:						
Minority Small Farmers Pilot Project	43,200	--	42,000	--	42,000	--
Food and Nutrition Service:						
Develop a USDA Workforce Diversity Strategy	50,000	--	50,000	--	50,000	--
Foreign Agricultural Service:						
U.S., Canadian, and Mexican Ag. Trade Policy	5,000	--	5,000	--	5,000	--
Food Safety and Inspection Service:						
On-Farm Food Safety Education Materials	108,000	--	108,000	--	108,000	--
HACCP Training and Support	151,869	--	151,869	--	151,869	--
Forest Service:						
Entrepreneurial Ag. and Forestry Programming	5,000	--	5,000	--	5,000	--
New York Urban Resources Partnership	50,000	--	50,000	--	50,000	--
Natural Resources Conservation Service:						
Regional Leadership Excellence Center	15,000	--	15,000	--	15,000	--
New York Urban Resources Partnership	10,000	--	10,000	--	10,000	--
Office of Chief Information Officer:						
Salary and Benefits for Detailee	6,364	--	--	--	--	--
Office of Small and Disadvantaged Business Utilization:						
Y2K Training for Small Business	5,000	--	--	--	--	--
Training for Y2K	50,000	--	--	--	--	--
Small Food Processors Curriculum	40,000	--	40,000	--	40,000	--
Small Farmers and Ranchers Symposium	25,000	--	25,000	--	25,000	--
Risk Management Agency:						
FCIC Nursery Crop Insurance Program	28,278	--	28,278	--	28,278	--
Effects on Yield and Quality of Winter Squash	10,837	--	10,837	--	10,837	--
Development of Risk Management Software	8,100	--	8,100	--	8,100	--
Small Farm Clientele Agriculture Workshop	5,400	--	--	--	--	--
National Agriculture Risk Education Library	21,600	--	--	--	--	--
Implementability of Income Protection	219,391	--	--	--	--	--
Crop Insurance on Range and Pasture	200,000	--	--	--	--	--
Avocado Revenue Program	76,087	--	--	--	--	--
Alternative Rating Methods	200,000	--	--	--	--	--
Risk Management Projects	301,834	--	100,000	--	100,000	--
Rural Development:						
Small Farmers and Ranchers Symposium	25,000	--	--	--	--	--
World Agricultural Outlook Board:						
Strengthening the Ag. Weather Information System	26,500	--	--	--	--	--
Various agencies sharing the cost of the National						
Small Farm Conference	80,000	--	--	--	160,000	--
Other Anticipated Reimbursements	--	--	3,469,695	--	3,272,208	--
Subtotal, Extension Other USDA Appropriations	1,767,460	0	4,118,779	0	4,081,292	0
Total, CSREES Other USDA Appropriations	9,155,193	9	12,211,294	9	12,173,807	9
Total, Agriculture Appropriations	932,958,193	390	1,102,407,294	440	1,104,568,807	451
Other Federal Funds:						
Research and Education Activities:						
Army Corps of Engineers:						
Inland Waterway Transportation Analysis	65,000	--	65,000	--	65,000	--
Water Quality Analysis	16,145	--	--	--	--	--
Ag-Based Remediation Project	1,789,000	--	--	--	--	--
Department of Commerce:						
National Oceanic and Atmospheric Administration,						
Atmospheric Deposition	222,508	--	222,508	--	222,508	--
National Institute of Standards and Technology,						
Electronic Commerce Activities	60,000	--	--	--	--	--
Department of Defense:						
Alternative Deployment Pilot Project	3,892,000	--	--	--	--	--
Agric. Based Bioremediation Technologies	1,996,000	--	300,000	--	300,000	--
Biosystems Technology	--	--	4,000,000	--	4,000,000	--
Department of Interior:						
Geological Survey, Investigational New Animal						
Drug (INAD) Coordinator	40,560	--	40,560	--	40,560	--
Geological Survey, Atmospheric Deposition	532,678	--	532,678	--	532,678	--
National Park Service, Atmospheric Deposition	164,174	--	164,174	--	164,174	--
Fish and Wildlife Service, Atmospheric Deposition	14,844	--	14,844	--	14,844	--
Bureau of Land Management, Atmospheric Deposition	36,000	--	36,000	--	36,000	--
Environmental Protection Agency:						
Atmospheric Deposition	267,857	--	267,857	--	267,857	--
Pest Management Alternatives	75,000	--	75,000	--	75,000	--
Agriculture in Concert with the Environment	125,000	--	125,000	--	125,000	--
Metropolitan Ecosystem Action Strategy	50,000	--	--	--	--	--
Food and Drug Administration:						
Investigational New Animal Drug (INAD) Coordinator	20,000	--	20,000	--	20,000	--
Food Safety Initiative Travel	8,000	--	--	--	--	--
Fumonisin MRI Study in Horses	40,000	--	--	--	--	--
Tennessee Valley Authority:						
Atmospheric Deposition	23,864	--	23,864	--	23,864	--
Other Anticipated Reimbursements	--	--	2,000,000	--	2,000,000	--
Subtotal, Res./Educ. Other Federal Funds	9,458,630	--	7,907,485	--	7,907,485	--

Item	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	2001 Estimated Amount	2001 Estimated Staff Years
Extension Activities:						
Department of Defense:						
Family Education and Advocacy Programs	6,208,497	--	6,576,000	--	6,576,000	--
Department of Interior:						
Fish and Wildlife 4-H Awards Program	12,500	--	12,500	--	12,500	--
Environmental Protection Agency:						
Training for Pesticide Applicators	1,880,000	--	1,880,000	--	1,880,000	--
FOREST*A*SYST	25,000	--	25,000	--	25,000	--
Education/Outreach Activities/Ecosystem	10,000	--	10,000	--	10,000	--
Urban Environmental Education Project	100,000	--	--	--	--	--
Extension Liaison at EPA Region II	40,000	--	--	--	--	--
Waste Water Treatment and Disposal Systems	50,000	--	--	--	--	--
National Small Farmers Conference	--	--	5,500	--	--	--
Indoor Environments Education and Training Initiative	--	--	142,000	--	142,000	--
Food and Drug Administration:						
Food Safety Education Partnership	20,000	--	--	--	--	--
Good Agriculture Practices	250,000	--	--	--	--	--
General Services Administration:						
Consortium for Education	7,000	--	--	--	--	--
Health and Human Services:						
Health Care Financing Administration, National Medicare Education Program Alliance Network	75,000	--	--	--	--	--
Housing and Urban Development:						
Healthy Homes Initiative	200,000	--	--	--	--	--
Walter Reed Army Medical Center:						
Personal Financial Management Training	--	--	9,526	--	--	--
Other Anticipated Reimbursements	--	--	3,469,695	--	3,272,208	--
Subtotal, Extension Other Federal Funds	8,877,997	0	12,130,221	0	11,917,708	0
Total,CSREES Other Federal Funds	18,336,627	0	20,037,706	0	19,825,193	0
Non-Federal Funds						
Extension Activities:						
AID-PASA International Extension	7,255,649	--	7,000,000	--	7,000,000	--
FTS 2000	1,000	--	1,000	--	1,000	--
Other Anticipated Reimbursements	--	--	1,750,000	--	2,000,000	--
Total, Non-Federal Funds	7,256,649	--	8,751,000	--	9,001,000	--
Total, CSREES Available Funds	958,551,469	390	1,131,196,000	440	1,133,395,000	451

(a) While $60,000,000 will be available for the Fund for Rural America in 2001, the distribution of the funding is not yet decided.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

Permanent Positions by Grade and Staff-Year Summary

1999 and Estimated 2000 and 2001

Grade	1999 Headquarters	2000 Headquarters	2001 Headquarters
ES-6	1	1	1
ES-5	3	3	3
ES-4	2	2	2
ES-3	1	1	1
ES-2	2	2	2
GS/GM-15	61	64	65
GS/GM-14	56	61	61
GS/GM-13	40	40	44
GS-12	36	40	42
GS-11	29	31	31
GS-9	23	25	25
GS-8	20	21	21
GS-7	28	36	37
GS-6	55	59	60
GS-5	16	20	22
GS-4	5	6	6
GS-3	2	2	2
GS-2	1	1	1
Total Permanent Positions	381	415	426
Unfilled Positions End-Of-Year	-13	-4	-4
Total, Permanent Full-Time Employment, End-Of-Year	368	411	422
Staff-Years: Ceiling	390	440	451

COOPERATIVE STATE RESEARACH EDUCATION, AND EXTENSION SERVICE

CLASSIFICATION BY OBJECTS
1999 Actual and Estimated 2000 and 2001

		1999	2000	2001
Personnel Compensation:				
Washington, D.C.		$19,731,871	$22,493,079	$23,450,743
Field		0	0	0
11	Total personnel compensation	19,731,871	22,493,079	23,364,307
12	Personnel benefits	4,081,181	4,619,365	4,784,582
13	Benefits for former personnel	1,426	1,426	1,426
	Total pers. comp. & benefits	23,814,478	27,113,870	28,150,315
Other Objects:				
21	Travel	2,311,305	2,461,803	2,444,665
22	Transportation of things	60,140	79,616	75,416
23.3	Communications, utilities, and misc. charges	784,206	839,414	846,585
24	Printing and reproduction	968,429	1,018,276	1,015,471
25.1	Advisory and assistance services	185,534	185,534	185,534
25.2	Other services	3,084,782	3,531,438	2,790,697
25.3	Purchases of goods and services from Government Accounts	3,444,707	3,982,235	3,118,400
26	Supplies and materials	670,238	951,606	935,730
31	Equipment	61,029	232,410	208,644
41	Grants, Contracts, etc.	886,912,987	963,632,973	932,623,441
43	Interest for prompt payment	102	102	102
	Total other objects	898,483,459	976,915,407	944,244,685
Total direct obligations		922,297,937	1,004,029,277	972,395,000
Position Data:				
Average Salary, ES positions		$114,133	$118,241	$121,024
Average Salary, GS positions		$59,127	$61,370	$63,337
Average Grade, GS positions		10.4	10.3	10.6

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Research and Education:

For payments to agricultural experiment stations, for cooperative forestry and other research, for facilities, and for other expenses, including $180,545,000 to carry into effect the provisions of the Hatch Act (7 U.S.C. 361a-i); $21,932,000 for grants for cooperative forestry research (16 U.S.C. 582a-a7); $30,676,000 for payments to the 1890 land-grant colleges, including Tuskegee University (7 U.S.C. 3222), of which $1,000,000 shall be made available to West Virginia State College in Institute, West Virginia, which for fiscal year [2000] 2001 and thereafter shall be designated as an eligible institution under section 1445 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3222); [$63,238,500] $6,394,000 for special grants for agricultural research (7 U.S.C. 450i(c)); [$13,721,000] $18,369,000 for special grants for agricultural research on improved pest control (7 U.S.C. 450i(c)); [$119,300,000] $150,000,000 for competitive research grants (7 U.S.C. 450i(b)); $5,109,000 for the support of animal health and disease programs (7 U.S.C. 3195); [$750,000 for supplemental and alternative crops and products (7 U.S.C. 3319d); $650,000 for grants for research pursuant to the Critical Agricultural Materials Act of 1984 (7 U.S.C. 178) and section 1472 of the Food and Agriculture Act of 1977 (7 U.S.C. 3318), to remain available until expended; $500,000] $1,000,000 for the 1994 research program (7 U.S.C. 301 note), to remain available until expended; [$3,000,000] $5,000,000 for higher education graduate fellowship grants (7 U.S.C. 3152(b)(6)), to remain available until expended (7 U.S.C.

2209b); [$4,350,000] $6,000,000 for higher education challenge grants (7 U.S.C. 3152(b)(1)); [$1,000,000] $2,000,000 for a higher education multicultural scholars program (7 U.S.C. 3152(b)(5)), to remain available until expended (7 U.S.C. 2209b); [$2,850,000] $3,500,000 for an education grants program for Hispanic-serving Institutions (7 U.S.C. 3241); $500,000 for a secondary agriculture education program and 2-year post-secondary education (7 U.S.C. 3152 (h)); $4,000,000 for aquaculture grants (7 U.S.C. 3322); [$8,000,000] $10,500,000 for sustainable agriculture research and education (7 U.S.C. 5811); [$9,200,000] $9,500,000 for a program of capacity building grants (7 U.S.C. 3152 (b)(4)) to colleges eligible to receive funds under the Act of August 30, 1890 (7 U.S.C. 321-326 and 328), including Tuskegee University, to remain available until expended (7 U.S.C. 2209b); $1,552,000 for payments to the 1994 Institutions pursuant to section 534(a)(1) of Public Law 103-382; and [$14,825,000] $4,288,000 for necessary expenses of Research and Education Activities, of which not to exceed $100,000 shall be for employment under 5 U.S.C. 3109; in all, [$485,698,000] $460,865,000.

None of the funds in the foregoing paragraph shall be available to carry out research related to the production, processing or marketing of tobacco or tobacco products.

Native American Institutions Endowment Fund:

For [establishment of a] the Native American institutions endowment fund[, as] authorized by Public Law 103-382 (7 U.S.C. 301 note), [$4,600,000] $7,100,000, provided that, hereafter, any distribution of the adjusted income from the Native

American institutions endowment fund shall be available for facility renovation, repair, construction, and maintenance in addition to other authorized purposes.

The first change deletes language for the supplemental and alternative crops program (7 U.S.C. 3319d) and for Critical Agricultural Materials Act of 1984 (7 U.S.C. 3318).

The second change provides language for the 1994 research program which reflects the authorization that funds be available until expended.

The third change deletes language establishing the Native American institutions endowment fund.

The fourth change establishes that funds under the Native American institutions endowment fund (7 U.S.C. 301 note) may be used to support facility renovation, repair, construction, and maintenance in addition to other authorized purposes.

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

Lead-Off Tabular Statement

Research and Education Activities

Appropriation Act, 2000	$490,298,000 A/
Budget Estimate, 2001	467,965,000
Decrease in Appropriation	$22,333,000

Adjustments in 2000:	
Appropriations Act, 2000	$490,298,000
Rescission Under P.L. 106-113	3,817,000
Adjusted base for 2000	$486,481,000
Budget Estimate, Current Law, 2001	467,965,000
Decrease from adjusted 2000	$18,516,000

A/ Does not include $120,000 transferred to CSREES of which $64,000 is transfered to this account. The request for Congressional Relations activities is being reflected under the Office of the Assistant Secretary for Congressional Relations.

Summary of Increases and Decreases

Item of Change	2000 Estimated	Pay Cost	Program Changes	2001 Estimated
Research and Education Activities:				
Payments under the Hatch Act	$180,545,000	- -	- -	$180,545,000
Cooperative Forestry Program	21,932,000	- -	- -	21,932,000
Payments to 1890 Colleges and Tuskegee University	30,676,000	- -	- -	30,676,000
Special Research Grants	60,048,500	- -	-$53,654,500	6,394,000
Critical Agricultural Materials	600,000	- -	-600,000	- -
Improved Pest Control	13,721,000	- -	+4,648,000	18,369,000
Aquaculture Centers, Sec. 1475	4,000,000	- -	- -	4,000,000
Sustainable Agriculture	8,000,000	- -	+2,500,000	10,500,000
Supp. & Alternative Crops	750,000	- -	-750,000	- -
1994 Research Program	500,000	- -	+500,000	1,000,000
National Research Initiative	119,300,000	- -	+30,700,000	150,000,000
Animal Health and Disease Research, Section 1433	5,109,000	- -	- -	5,109,000
Federal Administration (Direct Appropriation)	14,247,500	- -	-9,959,500	4,288,000
Higher Education Programs	22,452,000	- -	+5,600,000	28,052,000
Native American Institutions Endowment Fund	4,600,000	- -	+2,500,000	7,100,000
Total Available, Research and Education Activities	486,481,000	- -	-18,516,000	467,965,000

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

RESEARCH AND EDUCATION

PROJECT STATEMENT

(On basis of appropriation)

(Includes Carryover Balances)

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
Research & Education Activities:							
1. Hatch Act Research program:							
Formula funds	$132,941,948		$132,941,948		--	$132,941,948	
Multi-State research	42,422,313		42,422,313		--	42,422,313	
Subtotal	175,364,261		175,364,261		--	175,364,261	
Federal Administration (3%)	5,128,342		5,180,739		--	5,180,739	
Total	180,492,603		180,545,000		--	180,545,000	
2. Cooperative Forestry Research:							
Research program	21,274,040		21,274,040		--	21,274,040	
Federal Administration (3%)	657,960		657,960		--	657,960	
Total	21,932,000		21,932,000		--	21,932,000	
3. Payments to 1890 Colleges & Tuskegee University:							
Research program	28,785,720		29,755,720		--	29,755,720	
Federal Administration (3%)	890,280		920,280		--	920,280	
Total	29,676,000		30,676,000		--	30,676,000	
4. Special Research Grants:							
Advanced spatial technologies, MS	1,000,000		1,000,000		-1,000,000	--	
Aflatoxin research, IL	113,000		113,000		-113,000	--	
Agricultural diversification, HI	131,000		131,000		-131,000	--	
Agricultural diversity Red River, MN & ND	250,000		250,000		-250,000	--	
Agriculture-based industrial lubricants, IA	250,000		250,000		-250,000	--	
Agricultural telecommunications, NY	--		425,000		-425,000	--	
Agriculture water usage, GA	300,000		300,000		-300,000	--	
Alliance for food protection	300,000		300,000		-300,000	--	
Alternative crops, ND	550,000		550,000		-550,000	--	
Alternative crops for arid lands, TX	100,000		100,000		-100,000	--	
Alternative marine & fresh water species, MS	308,000		--		--	--	
Alternative salmon products, AK	400,000		552,500		-552,500	--	
Animal Science Food Safety Consortium	1,521,000		1,521,000		-1,521,000	--	
Apple Fire Blight, NY & MI	500,000		500,000		-500,000	--	
Aquaculture, LA	330,000		330,000		-330,000	--	
Aquaculture, NC	--		255,000		-255,000	--	
Aquaculture, VA	100,000		100,000		-100,000	--	
Aquaculture, Stoneville, MS	592,000		592,000		-592,000	--	
Aquaculture product and marketing & development, WV	750,000		750,000		-750,000	--	
Babcock Institute, WI	400,000		510,000		-510,000	--	
Barley feed for rangeland cattle, MT	600,000		637,500		-637,500	--	
BARD-US Israel Binational Agricultural Research & Development Program	400,000		--		+2,000,000	2,000,000	
Biodiesel research, MO	152,000		152,000		-152,000	--	
Blocking anhydrous methamphetamine production (IA)	--		212,500		-212,500	--	
Bovine tuberculosis (MI)	--		170,000		-170,000	--	
Brucellosis vaccines, MT	150,000		425,000		-425,000	--	
Center for animal health and productivity, PA	113,000		113,000		-113,000	--	
Center for innovative food technology, OH	381,000		--		--	--	

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
Center for rural studies, VT	280,000		280,000		-280,000	--	
Chesapeake Bay agroecology, MD	150,000		150,000		-150,000	--	
Chesapeake Bay aquaculture, MD	385,000		385,000		-385,000	--	
Citrus tristeza	508,000		595,000		-595,000	--	
Coastal cultivars (GA)	--		170,000		-170,000	--	
Competitiveness of agriculture products, WA	680,000		680,000		-680,000	--	
Contagious equine metritis, KY	150,000		--		--	--	
Cool season legume research	329,000		329,000		-329,000	--	
Cotton research, TX	200,000		--		--	--	
Cranberry/blueberry, MA	150,000		150,000		-150,000	--	
Cranberry/blueberry disease and breeding, NJ	220,000		220,000		-220,000	--	
Dairy & meat goat research, Prairie View A&M, TX	63,000		63,000		-63,000	--	
Delta rural revitalization, MS	148,000		148,000		-148,000	--	
Designing foods for health, TX	250,000		318,750		-318,750	--	
Diaprepes/root weevil (FL)	--		297,500		-297,500	--	
Drought mitigation, NE	200,000		200,000		-200,000	--	
Ecosystems, AL	500,000		500,000		-500,000	--	
Environmental research, NY	486,000		400,000		-400,000	--	
Environmental Risk Factors/Cancer, NY	100,000		170,000		-170,000	--	
Environmentally-safe products (VT)	--		170,000		-170,000	--	
Expanded wheat pasture, OK	285,000		285,000		-285,000	--	
Farm and rural business finance, IL & AR	87,000		87,000		-87,000	--	
Floriculture, HI	250,000		250,000		-250,000	--	
Food & Agriculture Policy Institute, IA & MO	800,000		800,000		-800,000	--	
Food irradiation, IA	200,000		200,000		-200,000	--	
Food Marketing Policy Center, CT	400,000		400,000		-400,000	--	
Food processing center, NE	42,000		42,000		-42,000	--	
Food quality, AK	350,000		350,000		-350,000	--	
Food safety, AL	300,000		446,250		-446,250	--	
Food systems research group, WI	225,000		425,000		-425,000	--	
Forages for advancing livestock production (KY)	--		212,500		-212,500	--	
Forestry research, AR	523,000		523,000		-523,000	--	
Fruit & vegetable market analysis, AZ & MO	320,000		320,000		-320,000	--	
Generic commodity promotion, NY	212,000		198,000		-198,000	--	
Global change	1,000,000		1,000,000		+567,000	1,567,000	
Global marketing support service, AR	127,000		127,000		-127,000	--	
Grain Sorghum, KS	106,000		106,000		-106,000	--	
Grass seed cropping systems for sustainable agriculture	423,000		423,000		-423,000	--	
Human nutrition, IA	473,000		473,000		-473,000	--	
Human nutrition, LA	752,000		752,000		-752,000	--	
Human nutrition, NY	622,000		622,000		-622,000	--	
Hydroponic tomatoes	200,000		200,000		-200,000	--	
Illinois-Missouri Alliance for Biotechnology	1,184,000		1,184,000		-1,184,000	--	
Improved dairy management, PA	296,000		296,000		-296,000	--	
Improved early detection of crop diseases (NC)	--		170,000		-170,000	--	
Improved fruit practices, MI	445,000		445,000		-445,000	--	
Infectious disease research, CO	250,000		255,000		-255,000	--	
Institute for food science and engineering, AR	1,250,000		1,250,000		-1,250,000	--	
Integrated production systems, OK	180,000		180,000		-180,000	--	
International agricultural market structures and institutions, KY	250,000		250,000		-250,000	--	
International arid lands consortium	400,000		400,000		-400,000	--	
Iowa Biotechnology Consortium	1,564,000		1,564,000		-1,564,000	--	
Jointed Goatgrass, WA	360,000		360,000		-360,000	--	
Livestock & dairy policy, NY & TX	475,000		475,000		-475,000	--	
Lowbush blueberry research, ME	220,000		220,000		-220,000	--	

Project	1999 Actual		2000 Estimated			2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Increase or Decrease	Amount	Staff Years
Maple research, VT	100,000		100,000		-100,000	--	
Meadowfoam, OR	300,000		300,000		-300,000	--	
Michigan Biotechnology Institute	575,000		575,000		-575,000	--	
Midwest Advanced Food Manufacturing Alliance	423,000		423,000		-423,000	--	
Midwest agricultural products, IA	592,000		592,000		-592,000	--	
Milk safety, PA	250,000		297,500		-297,500	--	
Minor use animal drugs	550,000		550,000		--	550,000	
Mollusean shellfish, OR	400,000		400,000		-400,000	--	
Multi-commodity research, OR	364,000		364,000		-364,000	--	
Multi-cropping strategies for aquaculture, HI	127,000		127,000		-127,000	--	
National Biological Impact Assessment Program	254,000		254,000		--	254,000	
Nematode resistance genetic engineering, NM	127,000		127,000		-127,000	--	
Nevada Arid Rangelands Initiative	--		255,000		-255,000	--	
New crop opportunities, AK	--		425,000		-425,000	--	
New crop opportunities, KY	--		595,000		-595,000	--	
Nonfood agricultural products, NE	64,000		64,000		-64,000	--	
Oil resources from desert plants, NM	175,000		175,000		-175,000	--	
Organic waste utilization, NM	100,000		100,000		-100,000	--	
Pasture and forage research, UT	225,000		225,000		-225,000	--	
Peach tree shortlife, SC	162,000		162,000		-162,000	--	
Peanut Allergy Reduction, SC	--		425,000		-425,000	--	
Pest control alternatives	106,000		106,000		-106,000	--	
Phytophthora root rot, NM	127,000		127,000		-127,000	--	
Plant, drought, & disease resistance gene cataloging, NM	150,000		212,500		-212,500	--	
Postharvest rice straw, CA	300,000		--		--	--	
Potato research	1,300,000		1,300,000		-1,300,000	--	
Precision agriculture, KY	500,000		850,000		-850,000	--	
Preharvest food safety, KS	212,000		212,000		-212,000	--	
Preservation and processing, OK	226,000		226,000		-226,000	--	
Rangeland ecosystems, NM	200,000		200,000		-200,000	--	
Red snapper research, AL	--		510,000		-510,000	--	
Regional barley gene mapping project	400,000		425,000		-425,000	--	
Regional crop information and policy centers	--		--		+1,500,000	1,500,000	
Regionalized implications of farm programs, MO & TX	294,000		294,000		-294,000	--	
Rice Modeling	296,000		296,000		-296,000	--	
Rural development centers	523,000		523,000		--	523,000	
Rural policies institute NE, MO, & AR	644,000		644,000		-644,000	--	
Russian wheat aphid	280,000		280,000		-280,000	--	
Seafood harvesting, processing, and marketing, AK	--		552,500		-552,500	--	
Seafood and aquaculture harvesting, processing, marketing, MS	305,000		305,000		-305,000	--	
Seafood safety, MA	--		255,000		-255,000	--	
Small fruit research, WA, OR & ID	300,000		300,000		-300,000	--	
Southwest consortium for plant genetics & water resources	338,000		338,000		-338,000	--	
Soybean cyst nematode, MO	475,000		475,000		-475,000	--	
STEEP II - Water quality in Pacific Northwest	500,000		500,000		-500,000	--	
Sustainable agriculture, CA	--		255,000		-255,000	--	
Sustainable agriculture, MI	445,000		445,000		-445,000	--	
Sustainable agriculture and natural resources, PA	95,000		95,000		-95,000	--	
Sustainable agriculture systems, NE	59,000		59,000		-59,000	--	
Sustainable beef supply, MT	500,000		637,500		-637,500	--	
Sustainable pest management for dryland wheat, MT	400,000		425,000		-425,000	--	
Swine waste management, NC	500,000		500,000		-500,000	--	
Tillage, silviculture, waste management, LA	212,000		212,000		-212,000	--	
Tomatoe with virus, GA	200,000		200,000		-200,000	--	

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease		2001 Estimated Amount	2001 Estimated Staff Years
Trade and Policy Research Center, ND	--		--		--		--	
Tropical aquaculture, FL	--		170,000		-170,000		--	
Tropical and subtropical research	2,724,000		2,724,000		-2,724,000		--	
Turkey coronavirus, IN	200,000		200,000		-200,000		--	
Urban pests, GA	64,000		64,000		-64,000		--	
Vidalia onions, GA	100,000		100,000		-100,000		--	
Viticulture, NY & CA	1,000,000		1,000,000		-1,000,000		--	
Water conservation, KS	79,000		79,000		-79,000		--	
Weed control	423,000		423,000		-423,000		--	
Wetland plants, LA	600,000		600,000		-600,000		--	
Wheat genetics, KS	261,000		261,000		-261,000		--	
Wood utilization	5,136,000		5,136,000		-5,136,000		--	
Wool research	300,000		300,000		-300,000		--	
All Other	--		--		--		--	
Federal Administration (4%)	[2,186,200]		[2,401,940]		[-2,146,188]		[255,768]	
Total	54,655,000		60,848,500		-53,654,500	(2a-d)	6,394,000	1/
Critical Agricultural Materials Act of 1984:								
Research Program	576,000		576,000		-576,600		--	
Federal Administration (4%)	24,000		24,000		-24,000		--	
Total	600,000		600,000		-600,000	(2e)	--	
Improved Pest Control:								
Emerging Pest/(Critical Issues)	200,000		200,000		+267,000		467,000	
Expert IPM Decision Support System	177,000		177,000		+83,000		260,000	
Integrated Pest Management	2,731,000		2,731,000		--		2,731,000	
Minor Crop Pest Management	8,990,000		8,990,000		+1,721,000		10,711,000	
Pest Management Alternatives	1,623,000		1,623,000		+2,577,000		4,200,000	
Federal Administration (4%)	[548,840]		[548,840]		[+185,920]		[734,760]	
Total	13,721,000		13,721,000		+4,648,000	(1a-d)	18,369,000	1/
Aquaculture Centers, Section 1475:								
Research program	3,840,000		3,840,000		--		3,840,000	
Federal Administration (4%)	160,000		160,000		--		160,000	
Total	4,000,000		4,000,000		--		4,000,000	
Sustainable Agriculture:								
Program	7,680,000		7,680,000		+2,480,000		10,080,000	
Federal Administration (4%)	320,000		320,000		+100,000		420,000	
Total	8,000,000		8,000,000		+2,580,000	(2f)	10,500,000	
Supplemental and Alternative Crops, Section 1473D:								
Canola research	550,000		550,000		-550,000		--	
Hesperaloe research	200,000		200,000		-200,000		--	
Federal Administration (4%)	[30,000]		[30,000]		[-30,000]		[--]	
Total	750,000		750,000		-750,000	(2g)	---	
Total	81,726,000		87,119,500		-47,856,500		39,263,000	
5. 1994 Research Program	--		480,000		+480,000		960,000	
Federal Administration (4%)	--		20,000		+20,000		40,000	
Total	--		500,000		+500,000	(3)	1,000,000	
6. National Research Initiative:								
Natural Resources and the Environment	--		20,500,000		+4,500,000		25,000,000	
Nutrition, Food Safety, & Health	--		16,000,000		+6,000,000		22,000,000	
Plants	--		41,000,000		+7,000,000		48,000,000	
Animals	--		29,000,000		+6,000,000		35,000,000	

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease		2001 Estimated Amount	2001 Estimated Staff Years
Processing for Adding Value or								
Developing New Products	--		8,200,000		+4,800,000		13,000,000	
Markets, Trade & Development	--		4,600,000		+2,400,000		7,000,000	
Global Climate Change	--		--		--		--	
Grants Awarded	119,239,464		--		--		--	
Federal Administration (4%)	[4,769,579]		[4,772,000]		[+1,228,000]		[6,000,000]	
Carryover			44,532,337		-44,532,337		--	
Total	119,239,464		163,832,337		-13,832,337	(4)	150,000,000	
7. Animal Health & Disease								
Research, Section 1433:								
Research program	4,904,640		4,904,640		--		4,904,640	
Federal Administration (4%)	204,360		204,360		--		204,360	
Total	5,109,000		5,109,000		--		5,109,000	
8. Federal Administration								
(direct appropriation):								
Agricultural development in the								
American Pacific	564,000		564,000		-564,000		--	
Agricultural Waste Utilization	250,000		425,000		-425,000		--	
Alternative Fuels	218,000		218,000		-218,000		--	
Animal Waste Management, OK	250,000		250,000		-250,000		--	
Biotechnology Research, MS	--		425,000		-425,000		--	
Center for Agriculture &								
Rural Development	355,000		355,000		-355,000		--	
Center for innovative food								
technology, OH	--		381,000		-381,000		--	
Center for North American								
Studies	87,000		87,000		-87,000		--	
Climate Change Research, FL	--		170,000		-170,000		--	
Cotton Research, TX	--		170,000		-170,000		--	
Geographic Information	844,000		850,000		-850,000		--	
Gulf Coast Shrimp Aquaculture,								
AZ, HI, MS, MA, SC	3,354,000		3,354,000		-3,354,000		--	
Livestock Marketing Information								
Center, CO	--		170,000		-170,000		--	
Mariculture, NC	250,000		250,000		-250,000		--	
Mississippi Valley State								
University	583,000		583,000		-583,000		--	
National Center for								
Competitiveness	300,000		308,000		-300,000		--	
PM-10 study, CA & WA	873,000		873,000		-873,000		--	
Precision Agriculture, AL, TN	--		425,000		-425,000		--	
Water Quality, IL, ND	--		637,500		-637,500		--	
REE Information System	1,000,000		2,000,000		+250,000		2,250,000	
All other:								
Peer Panels	350,000		350,000		--		350,000	
Pay costs and FERS	1,100,000		1,100,000		--		1,100,000	
Office of Extramural Programs	310,000		310,000		+278,000		588,000	
Total	10,688,000		14,247,500		-9,959,500	(5a-c)	4,288,000	
9. Higher Education:								
Graduate Fellowships Grants	28,000		3,000,000		+2,000,000	(6a)	5,000,000	
Carryover	--		2,912,000		-2,912,000		--	
Hispanic Serving Institution								
Education Grants Program	2,850,000		2,850,000		+650,000	(6b)	3,500,000	
1890 Capacity Building Grants	9,280,000		9,280,000		+300,000	(6c)	9,500,000	
Carryover	1,342		--		--		--	
Institution Challenge Grants	4,350,000		4,350,000		+1,650,000	(6d)	6,000,000	
Secondary Agriculture Education	500,000		500,000		--		500,000	
Multicultural Scholars								
Program	1,000,000		1,000,000		+1,000,000	(6e)	2,000,000	
Carryover	1,003,067		--		--		--	
Payments to the 1994 Institutions	1,552,000		1,552,000		--		1,552,000	
Federal Administration (4%)	[719,520]		[952,480]		[+187,520]		[1,860,000]	

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease		2001 Estimated Amount	2001 Estimated Staff Years
Total	20,544,409		25,364,000		+2,688,000		28,052,000	
18. Tribal College Endowment Fund								
Endowment Fund	4,600,000		4,600,000		+2,500,000	(7)	7,100,000	
Interest Earned	673,678		908,913		399,087		1,308,000	
Total	5,273,678		5,508,913		+2,899,087		8,408,000	
Total Research and Education obligations estimate	474,681,154	196	534,906,250	211	-65,561,250		469,345,000	216
Unobligated Balances:								
Available, start of year:	-45,476,218		-47,444,337		+47,444,337		--	
Lapsing	52,397		--		--		--	
Interest Earned	-673,678		-908,913		-399,087		-1,308,000	
Available, end of year:	47,444,337		--		--		--	
Total, Appropriation	476,028,000	196	486,681,000	211	-18,516,000		467,965,000	216

g/ Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 authorizes an integrated research, education, and extension competitive grants program. Water Quality, Food Safety, and Pesticide Impact Assessment Special Research Grants previously shown on the research and education project statement are now reflected on the integrated activities project statement.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

RESEARCH AND EDUCATION

PROJECT STATEMENT

(On basis of appropriation)

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Research & Education Activities:				
1. Hatch Act Research program:				
Formula funds	$132,941,948	$132,941,948	--	$132,941,948
Multi-State research	42,422,313	42,422,313	--	42,422,313
Subtotal	175,364,261	175,364,261	--	175,364,261
Federal Administration (3%)	5,180,739	5,180,739	--	5,180,739
Total	180,545,000	180,545,000	--	180,545,000
2. Cooperative Forestry Research:				
Research program	21,274,040	21,274,040	--	21,274,040
Federal Administration (3%)	657,960	657,960	--	657,960
Total	21,932,000	21,932,000	--	21,932,000
3. Payments to 1890 Colleges & Tuskegee University:				
Research program	28,785,720	29,755,720	--	29,755,720
Federal Administration (3%)	890,280	920,280	--	920,280
Total	29,676,000	30,676,000	--	30,676,000
4. Special Research Grants:				
Advanced spatial technologies, MS	1,000,000	1,000,000	--	1,000,000
Aflatoxin research, IL	113,000	130,000	17,000	113,000
Agricultural diversification, HI	131,000	131,000	--	131,000
Agricultural diversity Red River, MN & ND	250,000	250,000	--	250,000
Agriculture-based industrial lubricants, IA	250,000	250,000	--	250,000
Agricultural tele-communications, NY	--	500,000	75,000	425,000
Agriculture water usage, GA	300,000	300,000	--	300,000
Alliance for food protection	300,000	300,000	--	300,000
Alternative crops, ND	550,000	550,000	--	550,000
Alternative crops for arid lands, TX	100,000	100,000	--	100,000
Alternative marine & fresh water species, MS	303,000	--	--	--
Alternative salmon products, AK	400,000	650,000	97,500	552,500
Animal Science Food Safety Consortium	1,521,000	1,521,000	--	1,521,000
Apple Fire Blight, NY & MI	500,000	500,000	--	500,000
Aquaculture, LA	330,000	330,000	--	330,000
Aquaculture, NC	--	300,000	45,000	255,000
Aquaculture, VA	100,000	100,000	--	100,000
Aquaculture, Stoneville, MS	592,000	592,000	--	592,000
Aquaculture product and marketing & development, WV	750,000	750,000	--	750,000
Babcock institute, WI	400,000	600,000	90,000	510,000
Barley feed for rangeland cattle, MT	600,000	750,000	112,500	637,500
BARD-US Israel Binational Agricultural Research & Development Program	400,000	--	--	--
Biodiesel research, MO	152,000	152,000	--	152,000
Blocking anhydrous methamphetamine production (IA)	--	250,000	37,500	212,500
Bovine tuberculosis (MI)	--	200,000	30,000	170,000
Brucellosis vaccine, MT	150,000	500,000	75,000	425,000
Center for animal health and productivity, PA	113,000	113,000	--	113,000
Center for innovative food technology, OH	381,000	--	--	--
Center for rural studies, VT	200,000	200,000	--	200,000
Chesapeake Bay agroecology, MD	150,000	150,000	--	150,000
Chesapeake Bay aquaculture, MD	385,000	385,000	--	385,000
Citrus tristeza	500,000	700,000	105,000	595,000
Coastal cultivars (GA)	--	200,000	30,000	170,000

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Competitiveness of agriculture products, WA	680,000	680,000	--	680,000
Contagious equine metritis, KY	250,000	--	--	--
Cool season legume research	329,000	329,000	--	329,000
Cotton research, TX	200,000	--	--	--
Cranberry/blueberry, MA	150,000	150,000	--	150,000
Cranberry/blueberry disease and breeding, NJ	220,000	220,000	--	220,000
Dairy & meat goat research, Prairie View A&M, TX	63,000	63,000	--	63,000
Delta rural revitalization, MS	148,000	148,000	--	148,000
Designing foods for health, TX	250,000	375,000	56,250	318,750
Diaprepes/root weevil (FL)	--	350,000	52,500	297,500
Drought mitigation, NE	280,000	280,000	--	280,000
Ecosystems, AL	500,000	500,000	--	500,000
Environmental research, NY	486,000	486,000	--	486,000
Environmental Risk Factors/Cancer, NY	100,000	200,000	30,000	170,000
Environmentally-safe products (VT)	--	200,000	30,000	170,000
Expanded wheat pasture, OK	285,000	285,000	--	285,000
Farm and rural business finance, IL & AR	87,000	87,000	--	87,000
Floriculture, HI	250,000	250,000	--	250,000
Food & Agriculture Policy Institute, IA & MO	800,000	900,000	100,000	800,000
Food irradiation, IA	200,000	200,000	--	200,000
Food Marketing Policy Center, CT	400,000	400,000	--	400,000
Food processing center, NE	42,000	42,000	--	42,000
Food quality, AK	350,000	350,000	--	350,000
Food safety, AL	300,000	525,000	78,750	446,250
Food systems research group, WI	225,000	500,000	75,000	425,000
Forages for advancing livestock production (KY)	--	250,000	37,500	212,500
Forestry research, AR	523,000	523,000	--	523,000
Fruit & vegetable market analysis, AZ & MO	320,000	320,000	--	320,000
Generic commodity promotion, NY	212,000	198,000	--	198,000
Global change	1,000,000	1,000,000	--	1,000,000
Global marketing support service, AR	127,000	127,000	--	127,000
Grain Sorghum, KS	106,000	106,000	--	106,000
Grass seed cropping systems for sustainable agriculture	423,000	423,000	--	423,000
Human nutrition, IA	473,000	473,000	--	473,000
Human nutrition, LA	752,000	752,000	--	752,000
Human nutrition, NY	622,000	622,000	--	622,000
Hydroponic tomatoes	200,000	200,000	--	200,000
Illinois-Missouri Alliance for Biotechnology	1,184,000	1,184,000	--	1,184,000
Improved dairy management, PA	296,000	296,000	--	296,000
Improved early detection of crop diseases (NC)	--	200,000	30,000	170,000
Improved fruit practices, MI	445,000	445,000	--	445,000
Infectious disease research, CO	250,000	300,000	45,000	255,000
Institute for food science and engineering, AR	1,250,000	1,250,000	--	1,250,000
Integrated production systems, OK	180,000	180,000	--	180,000
International agricultural market structure and institutions, KY	250,000	250,000	--	250,000
International arid lands consortium	400,000	400,000	--	400,000
Iowa Biotechnology Consortium	1,564,000	1,564,000	--	1,564,000
Jointed Goatgrass, WA	360,000	360,000	--	360,000
Livestock & dairy policy, NY & TX	475,000	475,000	--	475,000
Lowbush blueberry research, ME	220,000	220,000	--	220,000
Maple research, VT	100,000	100,000	--	100,000
Meadowfoam, OR	300,000	300,000	--	300,000
Michigan Biotechnology Institute	675,000	675,000	--	675,000
Midwest Advanced Food Manufacturing Alliance	423,000	423,000	--	423,000
Midwest agricultural products, IA	592,000	592,000	--	592,000
Milk safety, PA	250,000	350,000	52,500	297,500

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Minor use animal drugs	550,000	550,000	--	550,000
Molluscan shellfish, OR	400,000	400,000	--	400,000
Multi-commodity research, OR	364,000	364,000	--	364,000
Multi-cropping strategies for aquaculture, HI	127,000	127,000	--	127,000
National Biological Impact Assessment Program	254,000	254,000	--	254,000
Nematode resistance genetic engineering, NM	127,000	127,000	--	127,000
Nevada Arid Rangelands Initiative	--	300,000	45,000	255,000
New corp opportunities, AK	--	500,000	75,000	425,000
New corp opportunities, KY	--	700,000	105,000	595,000
Nonfood agricultural products, NE	64,000	64,000	--	64,000
Oil resources from desert plants, NM	175,000	175,000	--	175,000
Organic waste utilization, NM	100,000	100,000	--	100,000
Pasture and forage research, UT	225,000	225,000	--	225,000
Peach tree shortlife, SC	162,000	162,000	--	162,000
Peanut Allergy Reduction, SC	--	500,000	75,000	425,000
Pest control alternatives	106,000	106,000	--	106,000
Phytophthora root rot, NM	127,000	127,000	--	127,000
Plant, drought, & disease resistance gene cataloging, NM	150,000	250,000	37,500	212,500
Postharvest rice straw, CA	300,000	--	--	--
Potato research	1,300,000	1,350,000	50,000	1,300,000
Precision agriculture, KY	500,000	1,000,000	150,000	850,000
Preharvest food safety, KS	212,000	212,000	--	212,000
Preservation and processing, OK	226,000	226,000	--	226,000
Rangeland ecosystems, NM	200,000	200,000	--	200,000
Red snapper research, AL	--	600,000	90,000	510,000
Regional barley gene mapping project	400,000	500,000	75,000	425,000
Regional crop information and policy centers	--	--	--	--
Regionalized implications of farm programs, MO & TX	294,000	294,000	--	294,000
Rice Modeling	296,000	296,000	--	296,000
Rural development centers	523,000	523,000	--	523,000
Rural policies institute NE, MO, & AR	644,000	644,000	--	644,000
Russian wheat aphid	200,000	200,000	--	200,000
Seafood harvesting, processing, and marketing, AK	--	650,000	97,500	552,500
Seafood and aquaculture harvesting, processing, marketing, MS	305,000	305,000	--	305,000
Seafood safety, MA	--	300,000	45,000	255,000
Small fruit research, WA, OR & ID	300,000	300,000	--	300,000
Southwest consortium for plant genetics & water resources	338,000	338,000	--	338,000
Soybean cyst nematode, MO	475,000	500,000	25,000	475,000
STEEP II - Water quality in Pacific Northwest	500,000	500,000	--	500,000
Sustainable agriculture, CA	--	300,000	45,000	255,000
Sustainable agriculture, MI	445,000	445,000	--	445,000
Sustainable agriculture and natural resources, PA	95,000	100,000	5,000	95,000
Sustainable agriculture systems, NE	59,000	59,000	--	59,000
Sustainable beef supply, MT	500,000	750,000	112,500	637,500
Sustainable pest management for dryland wheat, MT	400,000	500,000	75,000	425,000
Swine waste management, NC	500,000	500,000	--	500,000
Tillage, silviculture, waste management, LA	212,000	212,000	--	212,000
Tomatoe wilt virus, GA	200,000	200,000	--	200,000
Trade and Policy Research Center, ND	--	--	--	--
Tropical aquaculture, FL	--	200,000	30,000	170,000
Tropical and subtropical research	2,724,000	2,724,000	--	2,724,000
Turkey carnavirus, IN	200,000	200,000	--	200,000
Urban pests, GA	64,000	64,000	--	64,000
Vidalia onions, GA	100,000	100,000	--	100,000
Viticulture, NY & CA	1,000,000	1,100,000	100,000	1,000,000
Water conservation, KS	79,000	79,000	--	79,000
Weed control	423,000	423,000	--	423,000

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted	
Wetland plants, LA	600,000	600,000	--	600,000	
Wheat genetics, KS	261,000	261,000	--	261,000	
Wood utilization	5,136,000	5,786,000	650,000	5,136,000	
Wool research	300,000	300,000	--	300,000	
All Other	--	--	--	--	
Federal Administration (4%)	[2,186,200]	[2,529,528]	[-127,580]	[2,401,940]	
Total	54,655,000	63,238,000	3,189,500	60,048,500	a/
Critical Agricultural Materials Act of 1984:					
Research Program	576,000	625,880	49,880	576,000	
Federal Administration (4%)	24,000	24,280	280	24,000	
Total	600,000	650,000	50,000	600,000	
Improved Pest Control:					
Emerging Pest/(Critical issues)	200,000	200,000	--	200,000	
Expert IPM Decision Support System	177,000	177,000	--	177,000	
Integrated Pest Management	2,731,000	2,731,000	--	2,731,000	
Minor Crop Pest Management	8,990,000	8,990,000	--	8,990,000	
Pest Management Alternatives	1,623,000	1,623,000	--	1,623,000	
Federal Administration (4%)	[548,840]	[548,840]	[--]	[548,840]	
Total	13,721,000	13,721,000	--	13,721,000	a/
Aquaculture Centers, Section 1475:					
Research program	3,840,000	3,840,000	--	3,840,000	
Federal Administration (4%)	160,000	160,000	--	160,000	
Total	4,000,000	4,000,000	--	4,000,000	
Sustainable Agriculture:					
Program	7,680,000	7,680,000	--	7,680,000	
Federal Administration (4%)	320,000	320,000	--	320,000	
Total	8,000,000	8,000,000	--	8,000,000	
Supplemental and Alternative Crops, Section 1473D:					
Canola research	550,000	550,000	--	550,000	
Herperaloe research	200,000	200,000	--	200,000	
Federal Administration (4%)	[30,000]	[30,000]	--	[-30,000]	
Total	750,000	750,000	--	750,000	
Total	81,726,000	90,359,000	3,239,500	87,119,500	
5. 1994 Research Program	--	480,000	--	480,000	
Federal Administration (4%)	--	20,000	--	20,000	
Total	--	500,000	--	500,000	
6. National Research Initiative:					
Natural Resources and the Environment	20,500,000	20,500,000	--	20,500,000	
Nutrition, Food Safety, & Health	16,000,000	16,000,000	--	16,000,000	
Plants	41,000,000	41,000,000	--	41,000,000	
Animals	29,000,000	29,000,000	--	29,000,000	
Processing for Adding Value or Developing New Products	8,200,000	8,200,000	--	8,200,000	
Markets, Trade & Development	4,600,000	4,600,000	--	4,600,000	
All Other/Undistributed	--	--	--	--	
Federal Administration (4%)	[4,772,000]	[4,772,000]	[--]	[4,772,000]	
Carryover	--	--	--	--	
Total	119,300,000	119,300,000	--	119,300,000	

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
7. Animal Health & Disease Research, Section 1433:				
Research program	4,904,640	4,904,640	--	4,904,640
Federal Administration (4%)	204,360	204,360	--	204,360
Total	5,109,000	5,109,000	--	5,109,000
8. Federal Administration (direct appropriation):				
Agricultural development in the American Pacific	564,000	564,000	--	564,000
Agricultural Waste Utilization	250,000	500,000	75,000	425,000
Alternative Fuels	218,000	218,000	--	218,000
Animal Waste Management, OK	250,000	250,000	--	250,000
Biotechnology Research, MS	--	500,000	75,000	425,000
Center for Agriculture & Rural Development	355,000	355,000	--	355,000
Center for innovative food technology, OH	--	381,000	--	381,000
Center for North American Studies	87,000	87,000	--	87,000
Climate Change Research, FL	--	200,000	30,000	170,000
Cotton Research, TX	--	200,000	30,000	170,000
Geographic Information	844,000	1,000,000	150,000	850,000
Gulf Coast Shrimp Aquaculture, AZ, HI, MS, MA, SC	3,354,000	3,354,000	--	3,354,000
Livestock Marketing Information Center, CO	--	200,000	30,000	170,000
Mariculture, NC	250,000	250,000	--	250,000
Mississippi Valley State University	583,000	583,000	--	583,000
National Center for Competitiveness	300,000	300,000	--	300,000
PM-10 study, CA & WA	873,000	873,000	--	873,000
Precision Agriculture, AL, TN	--	500,000	75,000	425,000
Water Quality, IL, ND	--	750,000	112,500	637,500
REE Information System	1,000,000	2,000,000	--	2,000,000
All other:				
Peer Panels	350,000	350,000	--	350,000
Pay costs and FERS	1,100,000	1,100,000	--	1,100,000
Office of Extramural Programs	310,000	310,000	--	310,000
Total	10,688,000	14,825,000	577,500	14,247,500
9. Higher Education:				
Graduate Fellowships Grants	3,000,000	3,000,000	--	3,000,000
Carryover	--	--	--	--
Hispanic Serving Institution Education Grants Program	2,850,000	2,850,000	--	2,850,000
1890 Capacity Building Grants	9,200,000	9,200,000	--	9,200,000
Carryover	--	--	--	--
Institution Challenge Grants	4,350,000	4,350,000	--	4,350,000
Secondary Agriculture Education	500,000	500,000	--	500,000
Multicultural Scholars Program	1,000,000	1,000,000	--	1,000,000
Carryover	--	--	--	--
Payments to the 1994 Institutions	1,552,000	1,552,000	--	1,552,000
Federal Administration (4%)	[836,000]	[836,000]	[--]	[836,000]
Total	22,452,000	22,452,000	--	22,452,000
10. Tribal College Endowment Fund				
Endowment Fund	4,600,000	4,600,000	--	4,600,000
Interest Earned	673,678	980,913	--	980,913
Total	5,273,678	5,580,913	--	5,580,913
Total Research and Education obligations estimate	476,701,678	491,278,913	3,817,000	487,461,913

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Unobligated Balances:				
Available, start of year:	--	--	--	--
Lapsing	--	--	--	--
Interest Earned	-673,678	-980,913	--	-980,913
Available, end of year:	--	--	--	--
Total, Appropriation	476,028,000	490,298,000	3,817,000	486,481,000

1/ Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 authorizes an integrated research, education, and extension competitive grants program. Water Quality, Food Safety, and Pesticide Impact Assessment Special Research Grants previously shown on the research and education project statement are now reflected on the integrated activities project statement.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

FY 2001 EXPLANATORY NOTES
JUSTIFICATION OF INCREASES AND DECREASES

Research and Education Activities

(1) An increase of $4,648,000 for Improved Pest Control ($13,721,000 available in fiscal year 2000):

(a) An increase of $267,000 for Emerging Pests/Critical Issues to more quickly respond to new pests and diseases that threaten U.S. agriculture ($200,000 available in fiscal year 2000):

Opportunities for the introduction of new or newly emerging plant and animal pests and diseases have increased due to economic opportunities in production agriculture and the acceleration of global interchange via travel and trade. CSREES is uniquely poised to immediately address research needs to meet new and emerging pests and diseases. Research expertise in all fields of plant and animal sciences, coupled with the extension and outreach capabilities at land-grant institutions in every state and territory, allows immediate response to a problem.

This program provides flexibility to CSREES to quickly direct resources to emerging or high priority Department initiatives. This effort also contributes to the National Science and Technology Council's Committee on Environment and Natural Resources goals. The efforts supported in this program are consistent with the National Agriculture, Research, Extension, Education and Economics Advisory Board's priority on emerging plant and animal issues, particularly as related to preparedness and response capabilities. However, the existing Critical Issues funding of $200,000 in FY 2000 is not adequate to support these tasks.

Critical Issues funding cuts across three of the five CSREES Strategic Goals by providing early intervention into managing or eradicating new and emerging diseases threatening U.S. agriculture. The ability of research to react immediately to a new or emerging disease helps to prevent loss of revenue to grower or producer. New diseases often mean death of animals, crop loss to growers, and limitations on exports of the commodity affected by the new disease. This program contributes to Goal 1, "An Agricultural System that is Highly Competitive in a Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(b) An increase of $83,000 for Pest Management Information Decision Support System to collect and disseminate information for research program decision makers and others ($177,000 available in fiscal year 2000):

Explanation of Change. The Pest Management Information Decision Support System (PMIDSS) is designed to collect and disseminate information for research program decision makers and others. This increase will further the ability of PMIDSS to provide a platform to integrate databases and to utilize information for decision support to answer questions on policy, research priorities, and educational queries related to pest management and pest management programs. At this stage of development, the system is available via the World Wide Web for use by scientists within USDA and targeted individuals at land-grant universities.

However, the user base is expected to expand. PMIDSS is driven by a user's selection of a particular crop, followed by a pest that impacts that crop. After reviewing the available information derived either from databases and/or from prior evidence which has been placed in the system by experts, the users pose the following questions: 1) "Is this a significant pest problem?" and 2) "Is there an available and effective pest management tactic even after regulatory action triggered by the Food Quality Protection Act that may eliminate existing tactics?" Currently, the prototype version accesses the EPA Registration Database, IR-4 Minor or Specialty Crop Database, the CRIS Database (all via CD-ROM), and a National Center for Food and Agricultural Policy database on pesticide usage. Other database access is projected: a resistance database is under construction and access to the NAPIAP National Database and other databases are planned. The PMIDSS program contributes to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(c) An increase of $ 1,721,000 in Minor Crop Pest Management (IR-4) for development of data in support of pesticide and biological control agent registration packages submitted to EPA ($8,990,000 available in fiscal year 2000):

Explanation of Change. The IR-4 program is the principal public effort supporting the registration of pesticides and biological control agents for use on minor crops where there are no economic incentives to do so by private industry. IR-4 provides coordination, funding, and scientific guidance for both field and laboratory research to develop data in support of registration packages submitted to the Environmental Protection Agency (EPA). The enactment of the Food Quality Protection Act of 1996 poses additional challenges for IR-4 to pursue the development of alternatives for minor-use crops to replace the conventional pesticides that are subject to stricter registration standards. The program has been responsible for data to support 1,970 food use clearances (1,023 in the last ten

years), 3,225 ornamental crop registrations, and has supported research on 17 biopesticides which has resulted in 10 minor crop registrations. IR-4 relies on commodity producers, State and Federal research scientists and extension specialists to submit pest control needs important to the agricultural community. These needs are evaluated by industry registrants and EPA and are prioritized for purposes of research funding by national committees of agricultural scientists. This program contributes to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(d) An increase of $2,577,000 for the Pest Management Alternatives Program to respond to the environmental and regulatory issues confronting agriculture ($1,623,000 available in fiscal year 2000).

Explanation of Change. The Pest Management Alternatives Program (PMAP) was established in fiscal year 1996 as the primary vehicle to respond to the environmental and regulatory issues confronting agriculture. The purpose of this program is to develop replacement tactics and technologies for pesticides under consideration for regulatory action by EPA, and for which effective alternatives are not available. As the FQPA is implemented, this program will become more critical as a support base for pest management technologies, and additional funds will be required to maintain the pipeline of pesticide alternatives to replace the organophosphates and carbamates that will potentially be taken off the market. The program is structured to fund short-term projects aimed at adaptive research and implementation of tactics which have shown promise in previous testing. The focus of the program is primarily towards replacement of individual tactics in a pest management program on a single crop basis, and not towards entire crop or cropping system pest management issues. For example, this program might fund an implementation program aimed at replacing an organophosphate insecticide in tomato with another chemical. This program contributes to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(2) A net decrease of $52,504,000 for Special Research Grants ($73,398,000 available in fiscal year 2000) as follows:

(a) An increase of $2,000,000 for the Binational Agricultural Research and Development (BARD) Program to foster greater cooperation between the U.S. and Israel for their mutual benefit in advancing agriculture (no funding available in fiscal year 2000);

This change will increase funding for the BARD program in fiscal year 2001. An agreement between the United States and Israel to establish the United States-Israel Binational Agricultural Research and Development fund was signed in 1977. The purpose of this program is to foster greater cooperation between scientific communities in the United States and Israel for their mutual benefit in advancing agriculture. An initial endowment fund of $80 million was established by equal contributions from Israel and the United States. Additional funds ($5 million from each country) were provided to the endowment in FY 1985. Funding provided in fiscal year 2001 will be provided directly from CSREES to Israel, in accordance with the Agricultural Research, Extension, and Education Reform Act of 1998, to supplement the interest derived from existing BARD endowment funds. This funding will be matched by the Israeli government to support research of mutual interest to Israel and the United States. Research areas include agricultural economics, agricultural engineering, aquaculture, animal production, plant protection, post-harvest and food technologies, and soil, water, and the environment. BARD is a competitively-awarded grants program which has received funding from CSREES appropriations in fiscal years 1994 through 1999. Research supported under BARD contributes to each of the five CSREES Strategic Goals.

(b) An increase of $567,000 for Global Change-UV-B Monitoring Program to establish a ground based UV-B monitoring network to provide information on climatology of UV-B irradiance in rural areas of the U.S. ($1,000,000 available in fiscal year 2000):

The USDA UV-B Monitoring Program is a component of the U.S. Interagency UV-Monitoring Network Plan of the United States Global Change Research Program. The objectives of this plan are: (1) to collect UV-B radiation levels for research to understand factors affecting the transmission of UV-B rays through the atmosphere, research on the effect of UV radiation on plants, humans and animals, and materials and operational measurements in support of public UV-B advisories; (2) to detect trends of earth surface UV-B radiation levels; and (3) to provide data for evaluation of radiative transfer models and other global change research activities.

The increase requested restores funding to the level required to complete the establishment of the ground based UV-B monitoring network to provide information on climatology of UV-B irradiance in rural areas of the United States. Monitoring sites in six additional locations are required to complete the initial design for the network. Five high quality spectroradiometers are in the final stages of development and funding is required for their deployment to research sites and for their calibration and operating costs. Funds will be used to enhance the technical capability of the central calibration facility to ensure and improve

quality control of data and information produced by the network. Finally, data products will be developed to meet the needs of the biological research community determining the impact of UV-B irradiation on plant and animal

systems as well as natural ecosystems. The Global Change Special Research Grant contributes to CSREES Strategic Goal 4, "To Achieve Greater Harmony between Agriculture and the Environment," by determining the impact of UV-B radiation on crops, animals, trees, and the resulting effect on natural resources and the U.S. agricultural production system.

(c) An increase of $1,500,000 for the Regional Crop Information and Policy Centers Program to establish three pilot crop information and policy centers based on current high priority needs of commodity groups (No funding available in fiscal year 2000):

Global markets for food, fiber and feed products demand high quality at competitive prices. American farmers and agribusiness must also satisfy consumer expectations for food safety and environmental progress, a task made more difficult by ever-increasing production costs coupled with decreasing or unstable commodity prices. Added to these contemporary challenges are the implementation of the Food Quality Protection Act of 1996 (FQPA), which may eliminate some pest management tools growers have traditionally relied on, and rapid advances in agricultural biotechnology resulting in genetically modified organisms (GMOs) for use in pest management. Prevention-based, multi-tactic integrated pest management (IPM) systems are already in place on thousands of U.S. farms. Recent scientific advances and the healthy pace of innovation in the agricultural biotechnology and chemicals industries are providing pest managers with new tools and novel tactics to ensure a safe, nutritious, economical food supply for the American public, while maintaining a strong, competitive agricultural economy. Many of these new tools, while highly effective, significantly increase the complexity of pest management systems. A current and long-range challenge is to determine, through sound science, potential long-term risks and benefits of these new tools, including GMOs, in agriculture. Today, some markets are demonstrating consumer resistance and cynicism toward biotechnology. In the transition to biologically based pest management, we have a responsibility for advancing our ability to measure progress toward biointensive IPM and to address the challenge to quantify the linkages between IPM and attainment of environmental quality and human health goals.

Since crops, pests, and weather patterns differ so greatly from region to region within the United States, no single national public policy, research program, or regulatory approach to pest management will be universally effective across all agricultural regions. It is also not necessary, nor an efficient use of public and private resources, for every state within similar production regions to organize and support repetitive, and competing and often duplicate pest management program

efforts. Accordingly, this proposal would establish three Regional Crop Information and Policy Centers as pilot prototypes based on current high priority needs for the following commodity groups:

Vegetable Crop Center - for key production regions in the Great Lakes/Northeast region, North Central region, Western region, and/or the Southeast region. Vegetable growers and distributors, as well as consumers globally, face a complexity of pest management issues, including implications of FQPA implementation, information from the Pesticide Impact Assessment Program, and increased biotechnology/GMO development;

Fruit Crop Center - for key production regions in the Great Lakes/Northeast region, the Appalachian area, the Southeast region, and/or the Northwest region. Key to the identification of fruit crops as a priority for a pilot center is the loss of management tools through FQPA, information from the Pesticide Impact Assessment Program, and pest resistance development;

Major Acreage Crop Center - for North Central corn/soybean production areas and/or Southern cotton/other fiber crops. Issues which make these commodities a high priority include the intensity of GMO development and related controversy, the loss of viable management tools due to FQPA implementation, information from the Pesticide Impact Assessment Program, and pest resistance management.

Centers will be established based on a fair and open competitive application and selection process. Criteria for selection includes the expertise present at site, the commitment to accomplish the mission of the program, and the importance of the commodities to the selected site.

The centers will support the pest management needs of Federal and state regulators, extension personnel, and the public through a coordinated effort at the regional level. Each of the centers will:

- develop a comprehensive approach to evaluating long-term and secondary effects of biotechnology products used in pest management and provide information on an ongoing basis to growers, consumers, researchers, and regulators;

- develop and share information nationally in specific cross-commodity areas, such as biological control, invasive species, precision agriculture, resistance management, and information technology;

- facilitate the development of diverse stakeholder bases for new alliances to further implement multistate regional collaboration; and

- enhance the measurement and reporting of IPM adoption to document the attainment of IPM and environmental quality goals, and to address required program evaluation needs.

Each center will provide rapid response to information requests from cooperating agencies and will actively promote pest management education and implementation in both agricultural and urban environments. Key center activities will include:

- exercise leadership in promoting and evaluating new agricultural pest management technologies, including the products of biotechnology related to pest management;
- assist in the development and distribution of crop-specific FQPA risk mitigation and transition plans;
- assess the need for and support teaching resources in pest management education for producers as well as consumers;
- provide science-based, regionally-specific input for public policy and regulatory issues;
- coordinate and report on regional pest management research and implementation projects; and
- identify and organize pest management expertise within the regions to ensure rapid response capability for pest problems or public information needs.

Stakeholder involvement will identify and prioritize studies needed for commodity-based programs. Each of the centers will develop an overarching advisory committee of stakeholders with regional subcommittees to address regional production or commodity-based needs. Strong reliance will be placed on the established structure of the research, education, and extension functions of the land-grant university system.

The proposed initiative contributes to all five CSREES Strategic Goals: (1) An Agricultural Production System that is Highly Competitive in the Global Economy; (2) A Safe and Secure Food and Fiber System; (3) A Healthy, Well-Nourished Population; (4) Greater Harmony Between Agriculture and the Environment; and (5) Enhanced Economic Opportunity and Quality of Life for Americans.

(d) A decrease of $57,721,500 for Special Research Grants to eliminate funding for earmarked projects ($57,721,500 available in fiscal year 2000):

This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer-reviewed grants that meet National goals. Alternate funding from formula programs, State and local government, and private sources could be used to support aspects of these projects deemed to be of high priority at State and/or local levels.

(e) A decrease of $600,000 to eliminate funding for Critical Agricultural Materials ($600,000 available in fiscal year 2000):

This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer-reviewed grants that meet National goals. Alternate funding from formula programs, State and local governments, and private sources could be used to support aspects of this program deemed to be of a priority at State and/or local levels.

(f) An increase of $2,500,000 for the Sustainable Agriculture Research and Education Program to focus on organic farming ($8,000,000 available in fiscal year 2000):

Sustainable agriculture is economically viable, environmentally compatible, socially acceptable, and culturally appropriate. A component of sustainable agriculture is organic farming. Producers, consumers, the media, land-grant universities, and the USDA are showing increasing interest in organic farming and marketing, a small but rapidly growing segment of U.S. agriculture. CSREES is proposing an increase in the Sustainable Agriculture Research and Education (SARE) program to focus on organic farming. An initiative on organic research and extension will bring support and visibility to the partnership's efforts, provide leadership within the USDA, and serve an expanding and increasingly active constituency of producers and consumers. The SARE program can administer the initiative effectively and more efficiently than would be the case if a separate, new, program were established.

The development of an organic rule by USDA's Agricultural Marketing Service has legitimized and attracted substantial attention to organic agriculture, including over 275,000 public comments on the draft rule. The organic marketplace has grown at an estimated 20 percent per year in recent years, and is increasingly attractive to producers looking for profitable alternatives to low commodity prices. The existing SARE program has significant experience with organic farming and marketing issues under the larger umbrella of sustainable agriculture, and an innovative structure (regional organization with strong stakeholder involvement; integration of research with extension and outreach; multi-institutional collaboration; and a commitment to on-farm research) that is well-suited to involvement of organic stakeholders and to addressing organic farming and marketing research and extension in a holistic manner. Funding this program

would bring recognition and support to the growing investment by land-grant partners, but would likely involve significant administrative costs as a separate program.

The increase for research funds will be used to support competitive grants to facilitate the development of organic agriculture production and processing methods, evaluate the potential economic benefits to producers and processors who use organic methods, and explore market opportunities for organic products. Grants will be administered under SARE's existing administrative structure. However, additional expertise from producers, marketers, researchers, educators and organizations involved in organic farming and marketing would be sought where appropriate, e.g. in developing specific targets for regional calls for proposals, and in evaluating submitted proposals. Funds will support a balance of producer grants (small grants to individual producers and small groups of producers to conduct their own on-far experimentation) and larger grants to multi-disciplinary, multi-institutional teams, including farmers, as is currently the case with SARE funds. Experience has shown that producer grants complement the larger grants in two ways: by tapping producer innovations, and by field-testing and refining results of larger projects. An increase of $1,191,000 for SARE under Smith-Lever 3(d) would be used to support the development of knowledge and expertise in organic farming and marketing among Extension and other agricultural professionals through SARE's Professional Development Program (PDP).

Organic farming represents a small but rapidly-growing method of achieving profitable, competitive production (CSREES Goal 1) which also generally improves harmony with the environment (Goal 4). Specific outputs and outcomes would be developed collaboratively with organic farmers and other stakeholders as an integral part of implementation of this program, but would certainly include an increase in production and marketing options for organic farmers, which would in turn result in an increase in profits for both current and new organic farmers, and an increase in the number of organic farmers and processors and in the amount and variety of organic product available to consumers.

(g) A decrease of $750,000 to eliminate funding for Supplemental and Alternative Crops ($750,000 available in fiscal year 2000):

This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer-reviewed grants that meet National goals. Alternate funding from formula programs, State and local governments, and private sources could be used to support aspects of this program deemed to be of a priority at State and/or local levels.

(3) An increase of $500,000 for 1994 Competitive Research Grants to allow scientists at the thirty 1994 Institutions to participate in adaptive research relevant to local and National needs ($500,000 available in fiscal year 2000)

CSREES is proposing increased funding for the 1994 Institutions Competitive Research Grants Program as authorized by the Equity in Educational Land-Grant Status Act of 1994, as amended. These grants will allow scientists at the thirty 1994 Institutions to participate in adaptive research that addresses tribal, National, and multi-state priorities important to the Department, REE Mission Area, and CSREES. The increase addresses Recommendation No. 43 of the USDA Civil Rights Implementation Team that USDA examine funding of institutions of higher education to determine if 1890 and 1994 land-grant institutions are receiving equitable support to assist USDA in carrying out its mission.

The proposed research of the 1994 institutions will be of primary benefit to the specific and often unique needs of American Indians living on the nation's vast Indian reservations. The total land area is approximately 54.5 million acres, of which 75 percent is classified as agricultural lands and 15 percent forested. Research will address the five general goals of the CSREES strategic plan: (1) An Agricultural Production System that is Highly Competitive in the Global Economy; (2) A Safe and Secure Food and Fiber System; (3) A Healthy, Well-Nourished Population; (4) Greater Harmony Between Agriculture and the Environment; and (5) Enhanced Economic Opportunity and Quality of Life for Americans.

This program enables the 1994 institutions to conduct applied and adaptive research so that communities gain the tools and techniques needed to become significant contributors to the U.S. food supply and agricultural system. This includes areas such as soil and water quality research to meet certain standards of the Federal Clean Water Act; wildlife research to remedy the impact of adverse pollutants on local wild bird and deer populations; research on problems associated with amphibians and irrigation project lines; evaluation of native medicinal plant species; development and assessment of entrepreneurial strategies that improve families and ensure the survival of communities; study of range cattle and other livestock species, including bison, to improve production efficiency and determine the impact of livestock on ecosystem quality, such as on native trout and other fish populations; and other areas of research that relate broadly to the mandate of USDA as described in the 1998 Farm Bill.

(4) An increase of $30,700,000 for the National Research Initiative to enhance support of USDA's primary competitive research grants program ($119,300,000 available in fiscal year 2000):

National Research Initiative
FY 2000 and FY 2001
Funding by Category
($000)

NRI Category	FY 2000 Enacted	FY 2001 Estimate
Natural Resources & Environment	$ 20,500	$ 25,000
Nutrition, Food Safety and Health	16,000	22,000
Animals	29,000	35,000
Plants	41,000	48,000
Markets, Trade & Rural Development	4,600	7,000
Processing for Value Added or Developing New Products	8,200	13,000
TOTAL, NRI Categories	$119,300	$150,000
NRI Crosscutting Initiatives		
Animal Feeding Operations	1,375	0
Drought	925	0
Food Safety	12,400	20,788
Global Change Research	5,900	11,900
Human Nutrition	5,200	10,000
Integrated Science for Ecological Challenges (Invasive Species)	21,474 (3,702)	36,000 (4,500)
Pest Management	12,350	14,500
Small Farms	5,000	7,000
Emerging Diseases	6,120	8,000
Plant Genome	14,000	19,000
Animal Genome	6,500	10,916
Genetic Resources	4,500	7,000
Bioproducts	2,842	4,896

All Other Research Areas	20,714	0
Total, NRI	$119,300	$ 150,000
Biotechnology (included above)	$ 28,518	$ 47,909

Explanation of Change. The advent of the 21st century is bringing rapid technological advancements. Agriculture itself is a technology-driven enterprise with many new research developments being applied. Such advancement depends on a strong and substantial knowledge base. In many respects, agriculture has fallen behind other sectors in developing the necessary knowledge base. Major advancements in biomedical and other sciences have been attributed to substantially funded competitive research programs of other Federal agencies. The Federal government must be equally committed to advancing agricultural knowledge through a competitive peer review process. The USDA's primary competitive grants program, the National Research Initiative (NRI), is only a small portion of USDA's research portfolio (about 10 percent). The NRI supports high quality fundamental and applied sciences that have contributed to major improvements in agriculture. However, because of the program's small size, its impact has been limited and its potential has not been met. Increased funding will stimulate the program and enable it to begin to meet this potential. A substantial increase from its present $119.3 million to $150 million will provide the resources needed for the program to enhance and develop scientific areas that are critical, such as: agricultural genomics, food safety, environment and natural resource management, and competitiveness and profitability of agriculture.

GENOME AND BIOTECHNOLOGY:

Genomics, which is the understanding of the structure and function of genetic information, and biotechnology have had and will have a profound impact on the agricultural sector. Genomics and biotechnology are priority issues for the USDA because of potential benefits that may arise from the application of genetic technologies. The USDA also is seeking critical research results to generate science-based policy decisions regarding the risks and impacts that biotechnology may produce. CSREES, through increases to the NRI, is directing increased funds to genomics as part of a strongly coordinated Federal program which includes partners with the Agricultural Research Service, the National Science Foundation, Department of Energy, and the National Institutes of Health. Coordinated efforts include a Federal effort to map two important model plant species, *Arabidopsis* and rice; structural genomics of both plants and animals and physical and comparatives maps; sequencing of microbes of critical importance to agriculture, medicine and environment; and a comprehensive and uniform plan for development of databases that will house and allow access to genomic information. Increased funding for the NRI will allow full implementation of the following emphasis areas.

Increased funds would allow an increased emphasis on Plant and Animal Genomics Initiatives directed at identifying, mapping and understanding the function and control of genes. Such initiatives will improve agricultural productivity and efficiency, maintain the genetic diversity of plants and animals, and allow genetic backgrounds to be matched to desired traits. They will also provide means of integrating quantitative and molecular genetic information, allow transgenic methods to be used more effectively and integrate disease surveillance with host genetics. The initial primary emphasis will be to speed up progress in the development of basic reagents and tools, such as libraries, high density comparative maps, that are necessary to understand the organization and function of plant and animal genomes. Grants will be made to large centers, which are multi-disciplinary and multi-institutional in scope. Bioinformatics (e.g., software development projects that extract and analyze genomic data to allow adequate interpretation and use) would also be supported.

Increased funds would support a Microbial Genomics Initiative directed at the genomes of microbial species which make important contributions (either positive or negative) to the growth, development and health of plants, animals and the environment. Support would be provided for construction of genomic maps, map-based cloning of important genes and/or genome sequencing with the goal of using this knowledge to manipulate microbial genomes to improve productivity and sustainability of U.S. agriculture and forestry.

Increased funds would be used to provide more meaningful support to utilize advances in biotechnology to develop new agricultural products. Results from genome and functional genomics studies will be reduced to practice through genetic modification of crop plants and animals. Consideration will also be given to the integration of crop production and subsequent processing and separation of end products. Additionally, increased support will be provided for the Metabolic Engineering Interagency program, which involves cooperation of seven agencies, which also aims to capture the gains in biotechnology for production of new agricultural end uses.

FOOD SAFETY and NUTRITION:

Providing a safe and nutritious food supply is the foremost priority issue for the USDA. Increases in the NRI will be used in the following way for food safety and nutrition.

Additional funding would allow increased emphasis on Epidemiological Approaches for Food Safety. Significant gaps exist in the knowledge base for food safety and the risk factors involved in the production of food from farm to table. Pre- and post-harvest epidemiological research in conjunction with risk-assessment studies are vital to close these gaps. Large center type awards focused on fundamental, applied, and developmental research will be funded. These centers will be multi-disciplinary and possibly multi-institutional and will utilize systems-based approaches that integrate biological, physical, and social sciences.

Additional funding will also allow an increased emphasis on research that identifies emerging and re-emerging food borne diseases through enhanced or new surveillance methodologies. The goal will be to improve detection methods for microbial agents and naturally occurring toxicants. Research will also be aimed at developing diagnostic technologies to identify potential new pathogens and new serotypes or strains of current pathogens, at providing a better understanding of mechanisms that lead to antibiotic resistance of pathogens targeted in animal and poultry production, and at identification of obstacles to adopting safe food habits (with emphasis on factors affecting consumer attitudes and behavior).

Increased funding would allow new emphasis on the nutritional impact of newly "designed" foods. Advances in food technology through both traditional processing methodologies, and genetic engineering of foods, have provided the consumer with ever increasing food choices that claim to offer increased health benefits due to selection in favor of certain ingredients. Thus, a new approach is being taken to establish nutrient standards which goes beyond recognizing the role of nutrients in preventing nutritional deficiencies. Additional funding would expand the scope of the current Human Nutrition Program to include support for research on the nutritional impact of newly "designed" foods. This focus would address the bioavailability of nutrients and the effect of these food products on metabolic processes. Multi-disciplinary research would establish functional endpoints for assessing optimal health and performance; determine the quantities of nutrients that will achieve those endpoints without creating nutritional imbalances; and help design foods that provide desired levels of nutrients. Additional funds also would be used to investigate the status of plant and animal compounds with nutritional and health benefits from production through processing and as incorporated into food systems. Manipulation of the compounds (environmentally, genetically, through alteration of processing parameters or storage conditions, etc.) at the appropriate stage and the safety and efficacy testing of these products will be supported.

ENVIRONMENT AND AGRICULTURAL SYSTEMS

Additional funds would allow meaningful support of population and community biology of agricultural systems. A better understanding of the fundamental processes governing population and community dynamics is essential. Research on invasive species, threatened and endangered populations and communities, response of populations and communities to a changing environment, and species and community diversity would be included in this program. Increased support for this area will provide the tools necessary to effectively manage agricultural environments with the goal of improving agricultural productivity and sustainability.

Increased funds would be used to provide greater support for the Global Change Program. Greater emphasis is needed on research that increases understanding of the possible impacts of global environmental change on the sustainability of agriculture and forestry. Such research will define the effects of possible changes in temperature and precipitation patterns, rising atmospheric carbon dioxide levels and altered radiation

including UV-B) on crop productivity, natural resources, hydrological processes and water availability. Moreover, research is needed on ways to alleviate such changes, by evaluating carbon sequestration, bio-based fuels, and transgenic organisms adapted to particular stresses.

Increased funds would be used to provide more meaningful support to the Agricultural Systems Program. The NRI Agricultural Systems Program provides for mission oriented, multidisciplinary approaches to system levels studies of whole farms, whole ecosystems, and comprehensive management practices. Many projects supported through Agricultural Systems bring together the component research of other NRI programs and require approaches that bridge biological, physical and social sciences. Thus, the program is a vital link between more fundamental studies and application. Increased funding will enable the NRI to add emphasis to systems research, including studies that examine systems on differing scales, including that of small and mid-sized farms.

COMPETITIVENESS AND PROFITABILITY

Increased funds would be used to support research on added economic and social science associated with new and alternative crops. Integrated systems would be developed (production, processing and distribution) for generation of high value products, emphasizing local production and processing. Economic and market evaluations of new crops, new uses and classes of bio-based products as well as assessment of economic, environmental, and social impacts (e.g., measuring impacts on rural economic development and on the viability of small and medium sized farms) of their development would be included. Decision models for selecting among development alternatives for optimal economic, environmental, and performance outcomes would be developed.

Increased funding would be applied to expand research into natural resources and environmental economics and their impact upon competitiveness of the U.S. agricultural sector. Increased funding would also be used to examine the economics of small farms and their contributions to local economies, including their contributions to quality of life and amenities values. Increased funding would be used to examine the impacts that changes in policies and programs would have upon quality of life factors, characteristics of families and households and the longterm viability of rural communities.

IMPORTANT OTHER GOALS OF INCREASED FUNDING

Funding increases would renew the NRI commitment to increasing the size and quantity of high quality and high priority agricultural research projects. Increased funding would more successfully draw from the current large scientific community. It remains eager to seek solutions for agriculture but has been discouraged by funding uncertainties and the small size of NRI awards. Additional funds would be available for agricultural research at small and mid-sized institutions and in states that typically are less successful in the competitive grants arena. Finally, at current funding levels, the NRI and the USDA is not positioned to take full advantage of the potential scientific expertise because inadequate

funding discourages many excellent scientists from participating in USDA programs. Agriculture needs to attract the best scientists, regardless of where they work, to address key research problems. This is best done by competitive programs at adequate levels of funding. Substantial funding increases would attract more of the best scientists to work on problems of agriculture and attract beginning investigators into scientific fields that would benefit the agricultural system. The NRI program contributes significantly to the five CSREES Strategic Goals.

(5) A net decrease of $10,537,000 for Federal Administration ($14,247,000 available in fiscal year 2000):

(a) An increase of $250,000 and 2 staff years for the Research, Education, and Economics Information System to enable USDA and its partners to conduct project and program evaluations and improve effectiveness of planning, budgeting and coordination activities ($2,000,000 available in fiscal year 2000):

The Cooperative State Research, Education, and Extension Service has launched an effort to develop a state-of-the-art information technology system that will provide coherent access to programs and activities germane to four principle focus areas: research, education, extension, and economics/statistics. The Research, Education, and Economics Information System (REEIS) is intended to provide highly relevant quality data to enable the Department and its partners to conduct project and program evaluations and assessments; perform comprehensive baseline and time-series analyses; improve accuracy and reliability for program planning, budgeting, and coordination; and assess the impact of research, extension, and other activities, especially with regard to GPRA goals and objectives. Priority users targeted for REEIS include primarily senior level managers and decision makers; notably, REE agency administrators, budget analysts, national program leaders, commodity specialists, State research and extension program directors, and congressional staff.

The requested increase of $250,000 will support significant investment of staff time and technical expertise necessary to ensure the close alignment of REEIS system operational features with REE mission agency goals and objectives, strategic plans, and GPRA requirements, and begin development of a subject classification retrieval subsystem to ensure highly relevant subject access to research, extension, and education program and project data that would reside in REEIS. It is the confluence of system alignment with REE agency strategic goals and GPRA requirements and the ability to interrogate the system through sophisticated subject searching that is expected to form the most important ingredient for continuing success of REEIS in the new millennium.

The increase provides funding in FY 2001 for support of REEIS activities that include system operation and maintenance, the hiring and training of REEIS information technology staff, enhancement of targeted databases to ensure

REEIS-readiness, the identification of additional databases for potential linkage in REEIS, refinements to the REEIS World Wide Web user interface, conduct of user training and promotion, system evaluation through live system testing and user feedback, and the subsequent implementation of needed system modifications identified through evaluation and testing. REEIS is increasingly needed to satisfy accountability reporting by the Government Performance and Results Act (GPRA), and in particular, to meet requirements related to:

- Strategic planning.
- Performance assessment and evaluation of agricultural research, extension, and education programs.
- Accountability to Congress, commodity groups, and USDA management.
- Acquisition and dissemination of impact information.
- Reallocation of portfolios due to new and emerging high priority topics.
- Definition of the role and mission of agricultural research, extension, and teaching.

It is envisioned that REEIS will play a key role in implementation of the Agricultural Research, Extension, and Education Reform Act (AREERA) of 1998. REEIS would be positioned to:

- Provide linkages for decision making among REE agencies.
- Enable consistent reporting on identical or similar issues.
- Provide a better vehicle to facilitate interactions among REE agencies and partners.
- Link commonalities of research, extension, and teaching projects and programs through a single interface.
- Provide the public with understanding of the role and mission of REE agencies.
- Foster global interactions.

(b) A decrease of $10,487,500 to eliminate earmarked projects ($10,487,500 available in fiscal year 2000):

$	-564,000	Agriculture Development in the American Pacific
	-425,000	Agriculture Waste Utilization (WV)
	-218,000	Alternative Fuels Characterization Laboratory (ND)
	-250,000	Animal Waste Management (OK)
	-425,000	Biotechnology Research (MS)
	-355,000	Center for Agricultural and Rural Development (IA)
	-381,000	Center for Innovative Food Technology (OH)
	- 87,000	Center for North American Studies (TX)
	-170,000	Climate Change Research (FL)
	-170,000	Cotton Research (TX)
	-850,000	Geographic Information System

-3,354,000	Gulf Coast Shrimp Aquaculture
-170,000	Livestock Marketing Information Center (CO)
-250,000	Mariculture (NC)
-583,000	Mississippi Valley State University
-300,000	National Center for Peanut Competitiveness
-873,000	PM-10 Study (CA and WA)
-425,000	Precision Agriculture (AL and TN)
-340,000	Water Quality (IL)
-297,500	Water Quality (ND)
-$10,487,500	TOTAL

This change will eliminate funding for these projects for which prior funding has supported initial development. This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer-reviewed grants that meet National goals.

(c) An increase of $278,000 for partial support of the Office of Extramural Programs ($310,000 available in fiscal year 2000):

This change will provide additional support for an increased number of new programs and post-award activities associated with the management of existing programs, in response to recommendations made by the USDA Office of Inspector General in its review of CSREES in recent years.

(6) An increase of $5,600,000 for Higher Education programs ($22,452,000 available in fiscal year 2000):

One of the most crucial variables in the food and fiber system is scientific and professional human capital. The research and education agenda of the future depends on a highly trained cadre of qualified scientists, engineers, managers, and technical specialists. However, the higher education institutions that produce this essential human capital are confronted with two increasingly serious issues: expertise development and institutional development.

The CSREES Higher Education programs strengthen the five goals of the REE Strategic Plan by producing a capable and culturally diverse scientific base to advance the U.S. food and agricultural system. For example, by supplying scientists trained in the production and management sciences, and cutting edge science in genomics and biotechnology, contributions are made to an agricultural system that is competitive in the global economy (Goal 1). These programs contribute to a safe and secure food and fiber system (Goal 2) through support for graduate training in food science and engineering, epidemiology, risk assessment and related disciplines. These programs contribute to a healthy, well-nourished population (Goal 3) through support for training in human nutrition and related disciplines, and the social sciences to understand and enable behavioral change. These programs contribute to greater harmony between agriculture

and the environment (Goal 4) through support of the environmental, resource and production sciences. These programs contribute to enhanced economic opportunity and quality of life (Goal 5) not only through the specific sciences they support, but also through the recruitment and training of racial and ethnic minorities, and by broadening the array of scientific training for outstanding candidates.

(a) An increase of $2,000,000 for the Food and Agricultural Sciences National Needs Graduate Fellowship Grants Program to support the recruitment and training of outstanding graduate students in the food and agricultural sciences ($3,000,000 available in FY 2000):

The U.S. is a world leader in the food and agricultural sciences. The scientific workforce supporting the food and agricultural sector includes researchers, educators and extension specialists in government, universities, and industry who advance science and solve critical problems in producing, processing and marketing food and fiber. The Food and Agricultural Sciences National Needs Graduate Fellowship Grants Program is the only Federal program specifically targeted to the recruitment and training of outstanding graduate students in the food and agricultural sciences.

The Administration supports programs to recruit outstanding students into the sciences in other Federal agencies. The National Institutes of Health annually support 8,205 predoctoral traineeships. The National Science Foundation annually supports 3,664 predoctoral fellowships. And, the Environmental Protection Agency annually supports 400 M.S. and Ph.D. fellowships. Since its inception in 1984, USDA program has supported the training of about 1,000 graduate students in plant and animal biotechnology; food, forest and agricultural engineering; food, forest and agribusiness marketing or management; human nutrition and food science; water science. Due to its modest size, USDA's program has focused on support for Ph.D. studies, and at only a fraction of the volume of other Federal funding agencies. Furthermore, the amount of USDA stipends for graduate fellowships increased only once between 1984 and 1998. To remain even marginally competitive, it was necessary to increase stipends in FY 1999. This adjustment necessitated reducing the annual number of new fellows to an all-time low of 41.

At a time when nations worldwide have grasped that superior human capital is central to social, economic, and technological progress, U.S. food and agriculture competitiveness may ultimately be at risk from erosion of the scientific base. The requested increase will allow for expansion of the National Needs Fellowship Program to support the recruitment and training of master's as well as doctoral students -- a change that is essential if we are to recruit more minority students into the program. Federal agencies such as NSF, NASA, EPA and NIH successfully use fellowships for M.S. and Ph.D. students as a tool for reducing shortages. Outstanding minority students are aggressively courted by the private

sector, which can easily outbid graduate school recruiters. Hence, potential minority scientists frequently forego graduate education to enter the professional workforce. This is particularly important because a broader spectrum of science needs is rapidly emerging relative to food and agriculture.

The REE Strategic Plan outlines five primary functions, including "Strengthen the capacity of institutions of higher education to develop the skills of the Nation's workforce." The Food and Agricultural Sciences National Needs Graduate Fellowship Grants Program is instrumental in carrying out this function through the recruitment and training of the Nation's next generation of food and agricultural science researchers, educators and extension staff. Maintaining U.S. leadership in the sciences depends on a continuous pool of outstanding scientists and researchers.

(b) An increase of $650,000 for Hispanic-Serving Institutions Education Grants to strengthen academic programs and increase the capacity at Hispanic-Serving Institutions to deliver science-based education in the food and agricultural sciences ($2,850,000 available in FY 2000):

The USDA's Hispanic-Serving Institutions (HSI) Education Grants Program targets approximately 190 U.S. colleges and universities that have at least 25 percent Hispanic student enrollment. This grant program initiates and strengthens academic programs at these minority-serving institutions and increases their capacity to deliver science-based education in food, agriculture, renewable natural resources, family and consumer sciences, social sciences and related disciplines. It promotes and strengthens the capacity of Hispanic-Serving Institutions to carry out education programs that attract, retain, and graduate outstanding students capable of enhancing the Nation's food and agricultural scientific and professional work force.

Current appropriations are sufficient to support proposals from only about 10 percent of eligible Hispanic Serving Institutions. Current grants under the program support student experiential learning, student recruitment and retention, faculty development and curriculum development in fields such as human nutrition and dietetics, aquaculture, agricultural and food marketing, management, integrated resource management, food science and engineering. The requested increase will expand both the number of high-quality grant proposals funded and the number of colleges and universities participating in USDA academic initiatives for Hispanic-Serving Institutions.

The HSI Education Grants Program is the only USDA grant program that is specifically targeted to these institutions, most of which have not been previously involved with the Department. The competitive, peer reviewed nature of the

program assures scientific relevance and education quality. This program reinforces commitments made by Secretary Glickman to Hispanic Serving Institutions when he renewed a Memorandum of Understanding between the USDA and the Hispanic Association of Colleges and Universities on October 1996. The requested budget increase is compatible with the USDA Civil Rights Action Team Report recommendation that agencies better enable minority-serving institutions to assist the USDA in carrying out its mission.

(c) An increase of $300,000 for the 1890 Institutions Teaching and Research Capacity Building Grants Program to strengthen the teaching and research structure of the 1890 Institutions ($9,200,000 available in FY 2000):

The 1890 Institutions Capacity Building Grants Program is critical to achieving USDA's Workforce Diversity and Civil Rights goals. It is the Department's flagship initiative to recruit and train students from underrepresented groups for scientific and professional careers to advance the U.S. food and agricultural sector. It is a high impact program and unique in that it is the only Federal initiative targeted specifically towards strengthening the quality of programs in the food and agricultural sciences at the historically Black land-grant institutions. The program requires cooperation with one or more USDA agencies in developing a proposal and executing a project, thereby strengthening departmental partnerships and linkages with the 1890 institutions.

The program is helping to build world-class faculty and scientists and adding new fundamental and applied scientific knowledge on contemporary research topics such as genome mapping, DNA sequencing, GIS remote sensing, risk assessment and management, and information technology. Through curricula and teaching materials enhancement, it is increasing the quality and quantity of human capital in the food and agricultural sciences, and creating a broader range of students from diverse academic, social and economic backgrounds pursuing college degrees in appropriate disciplines. Improved centralized research support systems are more effectively meeting the local, state, regional and national needs of underserved clientele who lack either funds or ready access to more traditional support systems.

The Capacity Building Grants Program was launched in FY 1990 to build institutional teaching and research capacity at the 16 historically Black 1890 Land-Grant Institutions and Tuskegee University. The requested increase will enhance the capacity of institutions to respond to the complex needs of the food and agricultural sector. Specifically, the participating 1890 Institutions will: attract more students from underrepresented groups into the food and agricultural scientific and professional work force; expand scientific and education linkages among all of the 1890 institutions, and with other colleges and universities; and

strengthen the teaching and research infrastructure of participants to establish them as full partners in the contemporary food and agricultural science and education system.

The program cuts across all five general goals of the REE Strategic Plan by helping to produce a well prepared and culturally diverse workforce. Included in the REE Strategic Plan is the charge to "Strengthen the capacity of institutions of higher education to develop the skills of the Nation's workforce." The 1890 Institution Teaching and Research Capacity Building Grants Program is a vehicle for carrying out this function through funding innovative, collaborative projects at the 1980 institutions. Continued U.S. leadership in the food and agricultural sciences depends on maintaining a continuous, well trained and diverse workforce.

(d) An increase of $1,650,000 and 2 staff years for the Higher Education Challenge Grants Program to enhance higher education in the food and agricultural sciences at all 4-year institutions ($4,350,000 available in FY 2000):

USDA is the designated lead Federal agency for higher education in the food and agricultural sciences. CSREES has responsibility to initiate projects to strengthen college and university teaching in the food and agricultural sciences. Increased Challenge Grants funding will help USDA catch up with other Federal agencies (e.g., NASA and the Department of Energy) that are striving to advance the quality of the Nation's scientists.

The Higher Education Challenge Grants Program is the Department's flagship initiative to recapture excellence in agricultural education. It is the only Federal program targeted to enhancing higher education in the food and agricultural sciences at all 4-year institutions. This competitive grants program, initiated in FY 1990, enables colleges and universities to provide quality academic programs to produce graduates capable of strengthening and providing leadership to the Nation's food and agricultural scientific and professional work force. It provides incentives for new curricula and faculty development to stimulate institutional change.

Current funding does not meet existing needs or demand, and does not capture the benefits of enhanced curricula, faculty development, student experiential learning, instruction delivery systems, scientific instrumentation, and student recruitment and retention. Over ten years, only 24 percent of nearly 1,300 excellent proposals generated in this competitive process could be funded, and only programs at the undergraduate level could be addressed. Financial support has been level-funded for six years through FY 2000. An increase of $1,650,000 is requested to enhance programs and capabilities for educating baccalaureate students in priority food and agricultural science areas such as risk management,

food safety, international marketing, and sustainable agriculture. Through the matching support on a dollar-for-dollar basis from non-federal sources, the Federal investment is doubled and the program contributes to partnerships with the States and the private sector. Projects supported under the Higher Education Challenge Grants Program are required to address state, regional, national, or international educational needs, involve creative or novel approaches, encourage and facilitate better working relationships in the academic science and education community, and result in benefits that transcend project duration and USDA support.

The requested increase will enable more colleges and universities, including underserved ones, to focus on a broader span of curricular areas. It will enable more partnerships among institutions through increasing maximum awards up to $200,000 for individual projects and to $350,000 for joint projects involving 3 or more institutions or regional consortia. The Higher Education Challenge Grants Program was the top priority initiative by NASULGC's Board on Agriculture in its FY 2000 budget recommendations. The need for increased Challenge Grants funding has been expressed at stakeholder meetings with deans and directors of agriculture academic programs, extension and research faculty, the Academic Programs Section of NASULGC, and the Board of the American Association of State Colleges and Universities.

The REE Strategic Plan outlines five primary functions preformed by the mission area agencies, all of which are addressed through this program. Included in that list is "Strengthen the capacity of institutions of higher education to develop the skills of the Nation's workforce." The Higher Education Challenge Grants Program is the main vehicle for carrying out this function through funding innovative, collaborative projects that serve as models for other colleges and universities. Continued U.S. leadership in the food and agricultural sciences depends on maintaining a continuous pool of outstanding scientists and researchers.

(e) An increase of $1,000,000 for the Multicultural Scholars Program to increase multicultural diversity of the food and agricultural scientific and professional workforce ($1,000,000 available in FY 2000):

In FY 1994 a USDA Multicultural Scholars Program was initiated to attract and educate outstanding multicultural students at the post-secondary level for careers as agriscience and agribusiness professionals. The purpose is to increase the multicultural diversity of the food and agricultural scientific and professional workforce and to advance the educational achievement of all Americans. It is open to all U.S. colleges and universities with baccalaureate and higher degree programs in agriculture, forestry and natural resources, human sciences, veterinary medicine, and closely allied fields. The program requires 25 per cent non-Federal matching support. Participating colleges and universities are

encouraged to reach out to community colleges, where most minority students are enrolled, to attract these students into baccalaureate programs.

One intractable problem of the American educational system is the insufficient educational preparation of students who are economically deprived and often from racial and ethnic minority cultures. At the same time, the food and agricultural system suffers from inadequate representation of many Americans, especially racial and ethnic minorities, in its professional and scientific workforce. Post-secondary education participation and graduation rates for students in the targeted groups are substantially below comparable figures for other students. Data from the Census Bureau and the Department of Education indicate that while white, non-Hispanic persons represent 73 per cent of the total population, they receive 78.8 per cent of the baccalaureate and first professional degrees in the food and agricultural sciences. In contrast, the numbers for other groups are: Blacks -- 12 per cent of the total population, but only 2.8 per cent of the food and agricultural science degrees; Hispanics -- 10.7 per cent of the total population, but only 3.3 percent of the degrees; Native Americans and Alaskan Natives --0.8 per cent of the population, but only 0.6 per cent of the degrees; and Asians and Pacific Islanders -- 5.2 per cent of the population, but only 4 per cent of the degrees.

The Multicultural Scholars Program attracts exceptionally talented Black, Hispanic, Native American, and Asian students to degree programs in agriculture. Over the past five years, two-thirds of the students have been female and two-thirds began their scholarships as freshmen. The average SAT score is 1090 and the average ACT score is 21. The requested increase will expand the program so that approximately 100 new undergraduate students from underrepresented racial and ethnic groups can be recruited yearly and supported through four years of study in the food and agricultural sciences.

Between 1994 and 1997, the Multicultural Scholars Program awarded 61 grants supporting 206 scholars -- 87 Black, 44 Hispanic, 56 Native American/Alaskan Native, and 19 Asian recipients. Grants were awarded to 41 different institutions in 29 states in all regions of the country: 15 grants for 52 scholars in the Western region; 15 grants for 54 scholars in North Central region; 19 grants for 62 scholars in the south; 12 grants for 38 scholars in the North East.

In 1996, the program was expanded to include USDA mentors for students. Several agencies assist in mentoring scholars from underrepresented groups supported under this program. This enriches students' academic experiences and supports USDA's commitment to recruiting and retaining diverse students. This program contributes directly to the national goal of promoting excellence in science and engineering education. It supports all five of the REE mission area goals. In addition, it directly advances the goal of providing for better educated citizens, consumers, and leaders by increasing opportunities for students

from traditionally underrepresented ethnic and cultural groups to pursue a college education, and the goal of enhancing global competitiveness through a better qualified work force.

(7) An increase of $2,500,000 for the Native American Institutions Endowment Fund so that the interest derived from the fund is increased to support infrastructure enhancement at the 1994 Institutions ($4,600,000 available in fiscal year 2000):

The Native American Institutions Endowment Fund, authorized by Public Law 103-382, provides an endowment fund for the 30 1994 land-grant institutions (Tribal Colleges.) It is proposed that the annual contribution of $4,600,000 into the endowment fund through Fiscal Year 2002 be increased to $7,100,000. Awards would continue to be based on the formula specified in the existing authority. It is further proposed that the Tribal Colleges be strongly encouraged to use the interest derived from the endowment fund to support facility renovation and construction.

Annual appropriations with a formula-based disbursement of interest earned on the corpus of the endowment provides the board of each Tribal College with a critical tool for institutional planning. Sustained investment in physical infrastructure is essential for the Tribal Colleges to be effective partners in the land-grant system. This is especially true as the mission of the Tribal Colleges continues to expand to encompass education, extension, and research related activities. Such investment is in keeping with the Department's philosophy of developing all areas of human capital to remain competitive in a global economy.

Facilities at the Tribal Colleges are all too often in poor condition. Many campuses consist largely of condemned buildings posing a significant health and safety risk to both students and faculty. Students lack access to basic laboratories and equipment making accreditation difficult at best. Faculty turnover at these institutions is very high, due in part to the poor quality of the facilities. This places an additional faculty recruitment burden on the administration of the Tribal Colleges. At the same time, education enrollment at Tribal Colleges is increasing dramatically placing further burdens on an already fragile infrastructure.

There is a critical need for infrastructure funding for the Tribal Colleges. Current facilities at these institutions do not place them in a strong position to address research, higher education, or extension issues related to the food and agricultural sciences which are important to the communities they serve. Such funding would enhance the utilization of funds currently appropriated through the USDA, Cooperative State Research, Education, and Extension Service for higher education and extension programs as well a the new 1994 Institutions Research Program funded in fiscal year 2000.

This program contributes to the five CSREES Strategic Goals.

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

The Small Business Innovation Development Act (SBIR), Public Law 97-219, July 22, 1982, as amended by Public Law 99-443, October 6, 1986, was designed to strengthen the role of small, innovative firms in Federally funded research and development. Under this program, small firms receive at least a fixed minimum percentage of research and development awards made by Federal agencies with sizable research and development budgets. From FY 1986 through FY 1992, 1.25 percent of an agency's extramural research budget was set aside for purposes of the SBIR Act. The Small Business Research and Development Enhancement Act of 1992 (Public Law 102-564, October 28, 1991) has amended the set-aside percent for the SBIR program as follows: 1.5 percent in fiscal years 1993 and 1994, 2.0 percent in fiscal year 1995 and 1996, and 2.5 percent in each fiscal year thereafter.

Agency	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate
Agricultural Research Service	$ 1,450,000	$ 1,580,000	$ 1,285,000
Cooperative State Research, Education, and Extension Service	11,094,833	11,412,971	11,026,331
Economic Research Service	305,275	287,725	87,800
Forest Service	439,688	579,571	579,571
National Agricultural Statistics Service	6,250	7,875	7,875
FAS/International Cooperative Development	12,500	11,275	11,275
Total	$13,308,546	$13,879,417	$12,997,852

The functions of the SBIR program (solicitation, review and evaluation of proposals) have been centralized in order to most effectively and efficiently serve the SBIR community. Nine research topic areas have been established:

1. Forests and Related Resources. Research proposals are solicited to develop environmentally sound techniques to increase productivity of forest land and to increase the utilization of materials and resources from forest lands.

2. Plant Production and Protection. Research proposals are solicited to examine means of enhancing crop production by reducing the impact of destructive agents, developing effective crop systems that are economically and environmentally sound, enhancing the impact of new methods of plant manipulation, and developing new crop plants and new uses for existing crops.

3. Animal Production and Protection. Research proposals are solicited to find ways to enable producers of food animals to increase production efficiency and to assure a reliable and safe supply of animal protein and other animal products while conserving resources and reducing production costs.

4. Air, Water and Soils. Research proposals are solicited to develop technologies for conserving air, water and soil resources while sustaining agricultural productivity.

5. Food Science and Nutrition. Research proposals are solicited to develop new knowledge and a better understanding of the characteristics of foods and their nutritional impact; to apply new knowledge to improve our foods and diets; and to apply new knowledge to the production of useful new food products,

processes, materials, and systems including application of nutritional information to consumer foods and food service systems.

6. Rural and Community Development. Research proposals are solicited to develop knowledge and technology that will promote, foster, or improve the well-being of rural Americans.

7. Aquaculture. Research proposals are solicited to enhance the knowledge and technology base necessary for the continued growth of the domestic aquaculture industry as a form of production agriculture. Emphasis is placed on research leading to improved production efficiency and increased competitiveness of private sector aquaculture in the United States.

8. Industrial Applications. Research proposals are solicited to develop new or improved technologies that will lead to increased production of industrial products from agricultural materials.

9. Marketing and Trade. Research proposals are solicited to develop innovative marketing strategies to increase sales of agricultural, forestry, and agricultural products both in the United States and abroad.

TABLE 1 - FISCAL YEAR 1999
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

STATE	HATCH ACT AS AMENDED: HATCH FORMULA	HATCH ACT AS AMENDED: REGIONAL RESEARCH	HATCH ACT AS AMENDED: TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
ALABAMA	2,950,849	825,808	3,776,657	704,146	3,220,121	110,659	855,053	909,930	1,569,557	0	0	0	11,146,123
ALASKA	807,397	142,073	949,470	459,425	0	5,670	707,603	467,500	0	0	0	0	2,589,668
AMER SAMOA	674,936	21,571	696,507	0	0	0	5,800	0	0	0	0	0	702,307
ARIZONA	1,115,455	751,208	1,866,663	309,872	0	44,820	1,415,048	2,796,040	228,339	0	0	0	6,660,782
ARKANSAS	2,548,992	723,741	3,270,733	609,977	1,421,544	103,195	3,359,697	1,089,390	276,708	105,000	0	0	10,235,242
CALIFORNIA	3,431,351	1,516,622	4,947,973	648,765	0	537,590	3,279,495	13,919,909	1,568,613	408,564	0	175,000	25,486,909
COLORADO	1,523,019	984,978	2,487,997	296,277	0	210,815	1,681,533	2,148,460	250,088	0	0	0	7,055,168
CONNECTICUT	1,264,628	491,748	1,756,376	228,299	0	23,061	923,006	1,959,898	105,728	0	0	0	4,996,568
DELAWARE	875,072	367,850	1,242,922	65,151	547,569	26,878	104,057	1,719,533	194,100	0	0	0	3,902,210
DC	376,916	53,032	431,948	0	0	0	356,661	145,000	0	0	0	0	932,609
FLORIDA	2,179,740	658,470	2,838,210	554,594	1,201,917	113,554	3,033,985	2,748,664	538,988	0	0	0	11,025,912
GEORGIA	3,351,191	1,236,412	4,587,603	744,932	1,628,698	132,068	2,695,314	2,640,480	835,323	280,800	0	0	13,945,218
GUAM	700,571	121,649	822,220	37,960	0	0	266,043	0	0	0	0	0	1,126,223
HAWAII	883,040	380,931	1,263,971	173,918	0	3,371	2,248,865	1,389,359	97,979	2,880,875	574,247	0	8,610,383
IDAHO	1,431,635	592,265	2,023,900	473,020	0	50,456	1,147,756	890,298	0	0	0	0	4,585,432
ILLINOIS	4,260,518	1,112,027	5,372,543	350,660	0	151,166	2,165,159	4,508,123	321,204	0	0	0	12,868,857
INDIANA	3,937,893	841,847	4,779,740	377,851	0	100,108	1,177,968	2,604,000	158,779	0	0	0	9,198,466
IOWA	4,125,374	1,710,631	5,836,005	269,086	0	192,723	4,184,081	5,212,879	437,467	332,280	0	0	16,464,521
KANSAS	2,489,779	773,972	3,263,751	160,321	0	148,981	1,265,867	1,720,000	119,474	0	0	160,000	6,836,374
KENTUCKY	3,941,136	872,025	4,813,161	418,638	2,123,988	65,536	963,946	581,000	457,253	0	0	0	9,423,524
LOUISIANA	2,356,435	683,147	3,039,582	622,573	1,295,549	93,394	1,895,234	948,000	636,516	0	0	0	8,530,848
MAINE	1,245,782	512,627	1,758,309	581,785	0	17,296	1,032,336	748,529	15,000	0	0	0	4,151,255
MARYLAND	1,715,514	644,890	2,360,404	241,894	958,801	27,543	756,352	2,355,688	478,684	0	0	110,000	7,289,564
MASS	1,496,589	629,499	2,126,088	282,681	0	12,591	999,929	2,245,692	0	0	0	0	5,668,981
MICHIGAN	3,938,004	936,486	4,874,490	636,168	0	80,484	5,332,749	3,482,892	169,465	0	0	0	14,576,058
MICRONESIA	714,328	0	714,328	0	0	0	5,800	0	0	0	0	0	720,128
MINNESOTA	3,660,225	883,383	4,743,608	527,403	0	155,031	1,354,790	1,857,834	277,485	0	0	54,931	8,971,082
MISSISSIPPI	3,020,836	835,084	3,855,920	676,955	1,638,091	94,240	4,439,848	1,155,987	497,294	1,346,053	0	0	13,704,388
MISSOURI	3,734,163	789,169	4,523,332	445,829	2,031,527	159,491	2,384,180	2,476,832	423,855	0	0	0	12,445,046
MONTANA	1,354,351	663,300	2,017,651	432,233	0	54,399	1,651,244	1,779,567	826,640	0	0	0	6,961,734
NEBRASKA	2,315,011	895,539	3,210,550	133,129	0	147,736	2,689,426	1,563,338	465,978	0	0	0	8,410,157
NEVADA	801,589	363,173	1,164,762	119,534	0	8,634	6,423	600,000	0	0	0	0	1,899,353
N. HAMPSHIRE	1,015,133	368,616	1,383,751	323,468	0	7,209	6,325	524,943	0	0	0	0	2,245,696
NEW JERSEY	1,473,366	1,246,250	2,719,616	201,108	0	18,669	2,993,978	853,172	99,324	0	0	0	6,875,865
NEW MEXICO	1,151,195	399,580	1,550,775	255,490	0	33,447	1,148,036	310,000	725,503	0	0	0	4,023,251
NEW YORK	3,748,245	1,514,741	5,262,986	663,359	0	208,948	4,556,249	3,856,522	959,631	0	0	0	15,507,695
N. CAROLINA	5,022,258	1,184,199	6,206,457	690,551	2,618,546	146,451	1,708,380	4,785,260	892,329	234,000	0	0	17,381,974
N. DAKOTA	1,694,335	594,663	2,288,998	92,342	0	35,961	1,293,302	868,228	508,623	204,048	0	0	5,289,522
N. MARIANAS	662,436	0	662,436	0	0	0	5,800	7,125	0	0	0	0	675,361
OHIO	4,688,791	957,337	5,648,128	391,447	0	83,428	1,207,504	1,435,000	498,321	0	0	0	9,261,829
OKLAHOMA	2,371,757	593,840	2,965,597	364,255	1,337,421	128,302	951,890	1,701,507	1,030,000	234,000	0	0	8,712,972
OREGON	1,802,142	939,456	2,741,598	731,336	0	96,863	2,710,435	2,096,669	233,992	0	0	0	8,610,893
PENNA	4,627,700	1,252,898	5,880,598	513,807	0	150,304	1,004,990	3,004,500	14,744	0	0	0	10,568,943
PUERTO RICO	3,151,855	735,339	3,887,194	105,938	0	10,756	394,522	0	448,690	0	0	0	4,847,100
RHODE ISLAND	800,564	381,700	1,182,264	78,747	0	2,349	146,028	1,176,600	188,849	0	0	0	2,775,037
S CAROLINA	2,575,990	681,987	3,257,977	540,999	1,406,204	20,825	618,840	2,049,892	595,848	0	0	0	8,488,385
S DAKOTA	1,755,743	599,729	2,355,472	148,725	0	78,715	13,379	447,355	459,399	0	0	0	3,501,045
TENNESSEE	3,732,042	845,525	4,577,567	500,212	1,995,068	81,657	584,225	1,584,365	748,645	0	0	0	10,151,739
TEXAS	4,933,176	1,322,911	6,256,087	595,382	2,664,958	350,918	1,560,484	3,327,035	637,188	250,432	0	0	15,662,482
UTAH	1,008,425	729,669	1,738,094	173,916	0	39,876	2,037,505	2,186,574	0	0	0	0	6,175,967
VERMONT	1,066,476	323,217	1,389,693	337,064	0	15,669	2,233,528	532,737	76,985	0	0	0	4,585,696

TABLE 1 - FISCAL YEAR 1999
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

	HATCH ACT AS AMENDED												
STATE	HATCH FORMULA	REGIONAL RESEARCH	TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
V ISLANDS	685,062	116,305	803,367	51,556	0	0	161,437	0	0	0	0	0	1,016,360
VIRGINIA	3,192,247	773,814	3,966,861	568,190	1,716,725	76,261	640,695	1,964,169	634,852	0	0	0	9,568,773
WASHINGTON	2,042,835	1,466,617	3,509,452	717,742	0	139,140	2,908,283	3,161,688	80,881	408,564	0	0	10,945,750
W VIRGINIA	2,008,166	537,152	2,545,318	405,042	0	9,952	717,666	817,090	0	234,000	0	0	4,729,068
WISCONSIN	3,876,761	1,002,975	4,879,736	486,616	0	151,347	1,094,732	4,457,071	136,913	769,984	0	0	11,996,399
WYOMING	952,318	529,222	1,481,540	214,703	0	28,942	278,276	187,900	24,000	0	0	0	2,215,361
OTHER	0	0	219,398	0	38,600	0	0	0	86,000	0	0	0	343,998
SBIR	3,323,549	1,060,558	4,384,107	531,851	719,643	122,616	2,186,736	5,207,898	110,400	176,280	0	0	13,439,531
PEER PANEL	0	0	0	0	0	0	40,812	878,448	113,510	0	0	12,048	1,044,818
REIMBURSABLE	0	0	0	0	0	0	254,206	100,000	0	0	0	0	354,206
SUBTOTAL	132,785,084	42,153,159	175,157,641	21,264,920	26,764,970	4,892,130	87,838,311	114,300,566	20,445,140	7,884,880	574,247	511,979	461,634,806
OBLIGATED	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	132,785,084	42,153,159	175,157,641	21,264,920	26,726,370	4,892,130	87,838,311	114,300,566	20,445,140	7,884,880	574,247	511,979	461,634,806
UNOBLIG BAL	0	0	0	0	0	0	0	41,736,620	2,792,000	0	2,807,747	0	47,336,367
SUBTOTAL	132,785,084	42,153,159	175,157,641	21,264,920	26,764,970	4,892,130	87,838,311	156,037,208	23,237,140	7,884,880	3,381,994	511,979	508,971,173
FEDERAL ADMIN.													
OBLIGATED			5,128,342	657,960	890,280	204,360	3,644,560	4,707,026	772,947	2,803,120	424,251	0	19,232,846
UNOBLIGATED	0	0	52,397	0	0	0	0	1,805,029	120,000	0	250,179		2,227,605
SUBTOTAL	0	0	5,180,739	657,960	890,280	204,360	3,644,560	6,512,055	892,947	2,803,120	674,430	0	21,460,451
UNOB. SBIR	0	0	0	0	0	0	0	990,688	0	0	0	0	990,688
Tribal Endow.	0	0	0	0	0	0	0	0	4,600,000	0	0	0	4,600,000
BIOTECH RISK ASSESSMENT	156,864	49,756	206,620	9,120	20,750	12,510	31,129	231,850	0	0	0	(511,979)	0
TOTAL	132,941,948	42,202,915	180,545,000	21,932,000	28,676,000	5,109,000	91,514,000	163,771,801	28,730,087	10,688,000	4,056,424	0	536,022,312

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TABLE 2 - FISCAL YEAR 2000
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

STATE	HATCH ACT AS AMENDED: HATCH FORMULA	HATCH ACT AS AMENDED: REGIONAL RESEARCH	HATCH ACT AS AMENDED: TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
ALABAMA	2,947,163	825,738	3,772,901	704,201	3,220,381	110,575	0	0	0	0	0	0	7,808,058
ALASKA	806,256	142,061	948,317	459,460	0	5,666	0	0	0	0	0	0	1,413,443
AMER SAMOA	673,969	21,566	695,535	0	0	0	0	0	0	0	0	0	695,535
ARIZONA	1,113,914	751,144	1,865,058	309,897	0	44,785	0	0	0	0	0	0	2,219,741
ARKANSAS	2,543,779	723,678	3,267,458	609,024	1,421,659	103,117	0	0	0	0	0	0	5,401,258
CALIFORNIA	3,425,561	1,516,493	4,942,054	849,814	0	537,183	0	0	0	0	0	0	6,129,051
COLORADO	1,920,707	964,896	2,485,603	296,300	0	210,655	0	0	0	0	0	0	2,992,558
CONNECTICUT	1,263,074	491,706	1,754,780	228,317	0	23,043	0	0	0	0	0	0	2,006,140
DELAWARE	873,839	367,819	1,241,658	65,156	547,613	28,856	0	0	0	0	0	0	1,883,283
DC	553,816	53,027	606,843	0	0	0	0	0	0	0	0	0	606,843
FLORIDA	2,175,943	656,414	2,832,357	554,637	1,202,014	113,468	0	0	0	0	0	0	4,702,476
GEORGIA	3,346,355	1,236,307	4,582,662	744,991	1,928,846	131,967	0	0	0	0	0	0	7,288,466
GUAM	699,538	121,640	821,178	37,963	0	0	0	0	0	0	0	0	859,139
HAWAII	861,869	380,899	1,242,768	173,930	0	3,368	0	0	0	0	0	0	1,420,066
IDAHO	1,429,484	592,215	2,021,699	473,057	0	50,417	0	0	0	0	0	0	2,545,173
ILLINOIS	4,274,168	1,111,932	5,368,100	350,687	0	151,054	0	0	0	0	0	0	5,887,841
INDIANA	3,931,695	841,775	4,773,470	377,880	0	100,032	0	0	0	0	0	0	5,251,382
IOWA	4,118,906	1,710,485	5,829,391	269,107	0	192,577	0	0	0	0	0	0	6,291,075
KANSAS	2,486,180	773,906	3,260,086	160,333	0	146,849	0	0	0	0	0	0	3,567,268
KENTUCKY	3,935,334	871,951	4,807,285	418,670	2,124,159	65,488	0	0	0	0	0	0	7,415,602
LOUISIANA	2,353,364	683,089	3,036,453	622,620	1,295,654	93,323	0	0	0	0	0	0	5,048,050
MAINE	1,243,943	512,483	1,756,426	581,830	0	17,283	0	0	0	0	0	0	2,355,539
MARYLAND	1,713,073	644,835	2,357,908	241,913	956,878	27,522	0	0	0	0	0	0	3,586,221
MASS	1,494,489	628,445	2,123,934	282,703	0	12,581	0	0	0	0	0	0	2,419,218
MICHIGAN	3,932,106	936,406	4,868,512	636,218	0	80,433	0	0	0	0	0	0	5,585,161
MICRONESIA	713,237	0	713,237	0	0	0	0	0	0	0	0	0	713,237
MINNESOTA	3,854,341	883,308	4,737,649	527,444	0	154,913	0	0	0	0	0	0	5,420,006
MISSISSIPPI	3,017,433	635,013	3,652,446	677,007	1,638,223	94,169	0	0	0	0	0	0	6,261,845
MISSOURI	3,726,458	789,102	4,515,560	445,863	2,031,691	159,370	0	0	0	0	0	0	7,154,484
MONTANA	1,352,243	663,244	2,015,487	432,267	0	54,357	0	0	0	0	0	0	2,502,111
NEBRASKA	2,311,502	895,463	3,206,965	133,140	0	147,623	0	0	0	0	0	0	3,487,728
NEVADA	800,426	363,142	1,163,570	119,543	0	8,627	0	0	0	0	0	0	1,291,740
N HAMPSHIRE	1,013,538	368,587	1,382,125	323,493	0	7,204	0	0	0	0	0	0	1,712,822
NEW JERSEY	1,471,267	1,246,144	2,717,411	201,123	0	18,654	0	0	0	0	0	0	2,937,188
NEW MEXICO	1,149,569	399,546	1,549,115	255,510	0	33,422	0	0	0	0	0	0	1,838,047
NEW YORK	3,742,895	1,514,612	5,257,507	663,411	0	208,789	0	0	0	0	0	0	6,129,707
N CAROLINA	5,015,777	1,184,098	6,199,875	590,604	2,618,757	146,340	0	0	0	0	0	0	9,655,576
N DAKOTA	1,692,043	594,812	2,286,855	92,350	0	35,954	0	0	0	0	0	0	2,414,959
N MARIANAS	661,459	0	661,459	0	0	0	0	0	0	0	0	0	661,459
OHIO	4,681,493	957,257	5,638,750	391,477	0	83,366	0	0	0	0	0	0	6,113,593
OKLAHOMA	2,368,323	593,789	2,962,112	364,283	1,337,529	128,205	0	0	0	0	0	0	4,792,129
OREGON	1,799,164	939,376	2,738,540	731,394	0	96,789	0	0	0	0	0	0	3,566,723
PENNA	4,620,845	1,252,791	5,873,636	513,847	0	150,190	0	0	0	0	0	0	6,537,673
PUERTO RICO	3,149,412	735,278	3,884,688	105,946	0	10,749	0	0	0	0	0	0	4,001,383
RHODE ISLAND	799,463	381,668	1,181,131	78,753	0	2,348	0	0	0	0	0	0	1,262,232
S CAROLINA	2,572,530	681,929	3,254,459	541,040	1,406,317	20,809	0	0	0	0	0	0	5,222,625
S DAKOTA	1,753,140	599,676	2,352,816	146,736	0	78,655	0	0	0	0	0	0	2,578,209
TENNESSEE	3,727,137	845,453	4,572,590	500,250	1,995,229	61,610	0	0	0	0	0	0	7,129,679
TEXAS	4,925,419	1,322,798	6,248,217	595,427	2,665,173	350,651	0	0	0	0	0	0	9,859,468
UTAH	1,007,051	729,607	1,736,658	173,930	0	39,847	0	0	0	0	0	0	1,950,435
VERMONT	1,064,938	323,190	1,388,128	337,090	0	15,677	0	0	0	0	0	0	1,740,895

TABLE 2 - FISCAL YEAR 2000
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

	HATCH ACT AS AMENDED												
STATE	HATCH FORMULA	REGIONAL RESEARCH	TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
V. ISLANDS	684,064	118,295	802,359	51,560	0	0	0	0	0	0	0	0	853,919
VIRGINIA	3,187,905	773,548	3,961,453	568,234	1,716,864	78,202	0	0	0	0	0	0	6,324,753
WASHINGTON	2,039,663	1,466,492	3,506,155	717,794	0	139,035	0	0	0	0	0	0	4,362,984
W VIRGINIA	2,005,591	537,107	2,542,698	405,073	943,930	9,944	0	0	0	0	0	0	3,901,645
WISCONSIN	3,870,715	1,002,890	4,873,605	488,654	0	151,232	0	0	0	0	0	0	5,511,491
WYOMING	950,946	529,178	1,480,124	214,720	0	28,920	0	0	0	0	0	0	1,723,764
OTHER	0	219,398	219,398	0	38,600	0	0	0	0	0	0	0	257,998
SBIR	3,323,549	1,060,556	4,384,107	531,851	743,893	122,616	2,168,616	2,863,200	122,400	237,708	0	0	11,174,391
PEER PANEL	0	0	0	0	0	0	0	0	0	0	0	0	0
REIMBURSABLE	0	0	0	0	0	0	0	0	0	0	0	0	0
			0						0			0	
SUBTOTAL	132,774,061	42,369,060	175,143,121	21,266,520	29,735,410	4,688,510	2,168,616	2,863,200	0	0	0	0	236,425,465
			0										
UNOBLIG BAL	0	0	0	0	0	0	81,299,584	111,347,290	22,089,725	9,830,292	2,807,747	625,825	227,841,103
			0										
SUBTOTAL	132,774,061	42,369,060	175,143,121	21,266,520	29,735,410	4,688,510	83,468,200	114,210,490	22,089,725	9,830,292	2,807,747	625,825	464,266,568
FEDERAL ADMIN													
OBLIGATED			5,180,739	657,960	920,280	204,360	3,614,360	4,772,000	856,000	4,179,500	250,179	0	20,635,378
UNOBLIGATED	0	0	0	0	0	0	0	0	0	0	0		0
SUBTOTAL	0	0	5,180,739	657,960	920,280	204,360	3,614,360	4,772,000	856,000	4,179,500	250,179	0	20,635,378
UNOB SBIR	0	0	0	0	0	0	0	0	0	0	0	0	373,969
Tribal Endow.	0	0	0	0	0	0	0	0	4,600,000	0	0	0	4,600,000
BIOTECH RISK ASSESSMENT	167,887	53,253	221,140	7,520	20,310	16,130	38,940	317,510	6,275	0	0	(625,825)	0
TOTAL	132,941,948	42,422,313	180,545,000	21,932,000	30,676,000	5,109,000	87,119,500	119,300,000	27,552,000	14,247,500	3,057,926	0	489,538,826

TABLE 3 - FISCAL YEAR 2001
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

	HATCH ACT AS AMENDED											
STATE	HATCH FORMULA	REGIONAL RESEARCH	TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
ALABAMA	2,947,163	825,738	3,772,901	704,201	3,220,381	110,575	0	0	0	0	0	0	7,808,058
ALASKA	806,256	142,061	948,317	459,460	0	5,666	0	0	0	0	0	0	695,535
AMER SAMOA	673,969	21,566	695,535	0	0	0	0	0	0	0	0	0	2,219,741
ARIZONA	1,113,914	751,144	1,865,058	309,897	0	44,786	0	0	0	0	0	0	5,401,258
ARKANSAS	2,543,779	723,679	3,267,458	609,024	1,421,659	103,117	0	0	0	0	0	0	6,129,051
CALIFORNIA	3,425,561	1,516,493	4,942,054	649,814	0	537,183	0	0	0	0	0	0	2,992,558
COLORADO	1,520,707	964,896	2,485,603	296,300	0	210,655	0	0	0	0	0	0	2,006,140
CONNECTICUT	1,263,074	491,706	1,754,780	228,317	0	23,043	0	0	0	0	0	0	1,883,283
DELAWARE	873,839	367,819	1,241,658	65,156	547,613	28,856	0	0	0	0	0	0	606,843
DC	553,816	53,027	606,843	0	0	0	0	0	0	0	0	0	4,702,476
FLORIDA	2,175,943	656,414	2,832,357	554,637	1,202,014	113,468	0	0	0	0	0	0	7,288,466
GEORGIA	3,346,355	1,236,307	4,582,662	744,991	1,828,846	131,967	0	0	0	0	0	0	859,139
GUAM	699,536	121,640	821,176	37,963	0	0	0	0	0	0	0	0	1,420,066
HAWAII	861,809	380,699	1,242,768	173,930	0	3,368	0	0	0	0	0	0	2,545,173
IDAHO	1,429,484	592,215	2,021,699	473,057	0	50,417	0	0	0	0	0	0	5,887,841
ILLINOIS	4,274,168	1,111,932	5,386,100	356,887	0	151,054	0	0	0	0	0	0	5,251,382
INDIANA	3,931,695	841,775	4,773,470	377,880	0	100,032	0	0	0	0	0	0	6,291,075
IOWA	4,118,906	1,710,485	5,829,391	269,107	0	192,577	0	0	0	0	0	0	3,567,268
KANSAS	2,486,180	773,906	3,260,086	160,333	0	146,849	0	0	0	0	0	0	7,415,602
KENTUCKY	3,935,334	871,951	4,807,285	418,670	2,124,159	65,498	0	0	0	0	0	0	5,048,050
LOUISIANA	2,353,364	683,089	3,036,453	622,620	1,295,664	93,323	0	0	0	0	0	0	2,355,539
MAINE	1,243,943	512,493	1,756,426	581,630	0	17,283	0	0	0	0	0	0	3,586,221
MARYLAND	1,713,073	644,835	2,357,908	241,913	956,878	27,522	0	0	0	0	0	0	2,419,218
MASS	1,494,489	629,445	2,123,934	262,703	0	12,581	0	0	0	0	0	0	5,585,161
MICHIGAN	3,932,106	936,406	4,868,512	636,216	0	80,433	0	0	0	0	0	0	713,237
MICRONESIA	713,237	0	713,237	0	0	0	0	0	0	0	0	0	5,420,006
MINNESOTA	3,854,341	883,308	4,737,649	527,444	0	154,913	0	0	0	0	0	0	8,261,845
MISSISSIPPI	3,017,433	835,013	3,852,446	577,007	1,638,223	94,169	0	0	0	0	0	0	7,154,484
MISSOURI	3,728,458	789,102	4,517,560	445,863	2,031,691	159,370	0	0	0	0	0	0	2,502,111
MONTANA	1,352,243	663,244	2,015,487	432,267	0	54,357	0	0	0	0	0	0	3,487,728
NEBRASKA	2,311,502	895,463	3,206,965	133,140	0	147,623	0	0	0	0	0	0	1,291,740
NEVADA	800,426	363,142	1,163,570	119,543	0	8,627	0	0	0	0	0	0	1,712,822
N HAMPSHIRE	1,013,538	368,587	1,382,125	323,493	0	7,204	0	0	0	0	0	0	2,937,186
NEW JERSEY	1,471,267	1,246,144	2,717,411	201,123	0	18,654	0	0	0	0	0	0	1,838,047
NEW MEXICO	1,149,569	399,546	1,549,115	255,510	0	33,422	0	0	0	0	0	0	6,129,707
NEW YORK	3,742,895	1,514,812	5,257,507	663,411	0	208,789	0	0	0	0	0	0	9,655,576
N. CAROLINA	5,015,777	1,184,098	6,199,875	690,604	2,618,757	146,340	0	0	0	0	0	0	2,414,959
N DAKOTA	1,892,043	594,612	2,286,655	92,350	0	35,954	0	0	0	0	0	0	661,459
N MARIANAS	661,459	0	661,459	0	0	0	0	0	0	0	0	0	6,113,593
OHIO	4,681,493	957,257	5,638,750	391,477	0	83,366	0	0	0	0	0	0	4,702,129
OKLAHOMA	2,368,323	593,789	2,962,112	364,263	1,337,529	128,205	0	0	0	0	0	0	3,566,723
OREGON	1,799,164	939,378	2,738,540	731,394	0	96,789	0	0	0	0	0	0	6,537,673
PENNA	4,620,845	1,252,791	5,873,636	513,847	0	150,190	0	0	0	0	0	0	4,001,383
PUERTO RICO	3,149,412	735,276	3,884,688	105,946	0	10,749	0	0	0	0	0	0	1,262,232
RHODE ISLAND	799,463	381,668	1,181,131	78,753	0	2,348	0	0	0	0	0	0	5,222,825
S. CAROLINA	2,572,530	681,929	3,254,459	541,040	1,406,317	20,809	0	0	0	0	0	0	2,578,209
S. DAKOTA	1,753,140	599,678	2,352,818	146,736	0	78,655	0	0	0	0	0	0	7,129,879
TENNESSEE	3,727,137	845,453	4,572,590	500,250	1,995,229	81,610	0	0	0	0	0	0	9,659,468
TEXAS	4,925,419	1,322,798	6,248,217	595,427	2,665,173	350,651	0	0	0	0	0	0	1,950,435
UTAH	1,007,051	729,607	1,736,658	173,930	0	39,847	0	0	0	0	0	0	1,740,395
VERMONT	1,064,938	323,190	1,388,128	337,090	0	15,677	0	0	0	0	0	0	

TABLE 3 - FISCAL YEAR 2001
DISTRIBUTION OF FEDERAL PAYMENTS FOR RESEARCH AT STATE AGRIC EXPERIMENT STATIONS & OTHER STATE INSTITUTIONS

	HATCH ACT AS AMENDED												
STATE	HATCH FORMULA	REGIONAL RESEARCH	TOTAL	COOP FORESTRY RSH (MS)	1890 UNIV & TUSK UNIV (EA)	ANIMAL HEALTH & DIS RSCH	SPECIAL RESEARCH GRANTS	COMPET RESEARCH GRANTS	HIGHER EDUCATION GRANTS	FED ADMIN DIRECT APPROP	FACILITIES	BIOTECH RISK ASSESS	TOTAL FEDERAL FUNDS
V ISLANDS	684,064	118,295	802,359	51,560	0	0	0	0	0	0	0	0	853,919
VIRGINIA	3,187,905	773,548	3,961,453	568,234	1,716,864	78,202	0	0	0	0	0	0	6,324,753
WASHINGTON	2,039,603	1,466,492	3,506,155	717,794	0	139,035	0	0	0	0	0	0	4,362,984
W VIRGINIA	2,005,591	537,107	2,542,698	405,073	943,930	9,944	0	0	0	0	0	0	3,901,645
WISCONSIN	3,670,715	1,002,890	4,673,605	486,654	0	151,232	0	0	0	0	0	0	5,511,491
WYOMING	950,946	529,178	1,480,124	214,720	0	28,920	0	0	0	0	0	0	1,723,764
OTHER	0	219,398	219,398	0	38,600	0	0	0	0	0	0	0	257,998
SBIR	3,323,549	1,060,558	4,384,107	531,851	743,893	122,616	896,312	3,600,000	138,000	0	0	0	10,416,779
PEER PANEL	0	0	0	0	0	0	0	0	0	0	0	0	0
REIMBURSABLE	0	0	0	0	0	0	0	0	0	0	0	0	0
			0						0			0	
SUBTOTAL	132,774,061	42,369,060	175,143,121	21,266,520	29,735,410	4,888,510	896,312	3,600,000	0	0	0	0	235,667,873
			0										
UNOBLIG BAL	0	0	0	0	0	0	36,876,168	140,400,000	27,814,000	0	0	265,100	205,355,268
			0										
SUBTOTAL	132,774,061	42,369,060	175,143,121	21,266,520	29,735,410	4,888,510	37,772,480	144,000,000	27,952,000	0	0	265,100	441,023,141
FEDERAL ADMIN OBLIGATED			5,180,739	657,960	920,280	204,360	1,490,520	6,000,000	1,100,000	4,288,000	0	0	19,841,859
UNOBLIGATED	0	0	0	0	0	0	0	0	0	0	0		0
SUBTOTAL	0	0	5,180,739	657,960	920,280	204,360	1,490,520	6,000,000	1,100,000	4,288,000	0	0	19,841,859
UNOB SBIR	0	0	0	0	0	0	0	0	0	0	0	0	0
Tribal Endow	0	0	0	0	0	0	0	0	7,100,000	0	0	0	7,100,000
BIOTECH RISK ASSESSMENT	167,887	53,253	221,140	7,520	20,310	16,130	0	0	0	0	0	(265,100)	0
TOTAL	132,941,948	42,422,313	180,545,000	21,932,000	30,676,000	5,109,000	39,263,000	150,000,000	36,152,000	4,288,000	0	0	467,965,000

Table 4
National Research Initiative Competitive Grants Program
Proposals Submitted For and Grants Awarded From the Fiscal Year 1999 Appropriation

Program	Proposals Received	Dollars Requested	Grants Awarded in 1999	Dollars Awarded in 1999	Grants Awarded in 2000	Dollars Awarded in 2000
NATURAL RESOURCES AND THE ENVIRONMENT						
Improved Utilization of Wood and Wood Fiber	80	13,399,078	10	1,524,000	9	$1,037,018
Ecosystem Science	108	37,808,898	12	3,500,000	7	1,371,500
Plant Responses to the Environment	93	24,052,848	15	1,994,805	1	100,000
Soils and Soil Biology	92	22,343,091	15	3,373,500	4	884,000
Water Resources Assessment and Protection	115	31,718,341	7	1,356,000	17	3,064,500
Subtotal	488	129,422,354	59	11,748,305	38	6,457,018
NUTRITION, FOOD QUALITY AND HEALTH						
Food Safety	127	32,235,783	10	1,503,849	15	2,558,093
Improving Human Nutrition for Optimal Health	134	37,510,994	24	4,340,554	2	280,000
Epidemiological Approaches for Food Safety	52	36,746,817	0	0	9	5,312,072
Subtotal	313	106,493,594	34	5,844,403	26	8,150,165
ANIMALS						
Animal Reproductive Efficiency	111	26,741,185	28	4,232,893	3	321,925
Animal Genome and Genetic Mechanisms	72	26,605,845	9	2,331,208	11	3,745,547
Animal Growth, Development, and Nutrient Utilization	78	19,526,531	13	2,185,346	5	1,041,000
Animal Health and Well-Being	247	65,176,946	42	8,223,891	15	2,884,685
Subtotal	506	140,052,489	90	16,973,338	34	8,003,157
PLANT SYSTEMS						
Biologically Based Pest Management	71	14,450,288	10	1,570,076	5	740,599
Entomology and Nematology	181	39,493,457	22	3,430,258	21	2,964,742
Nitrogen Fixation/Nitrogen Metabolism	39	7,874,812	8	1,070,500	7	1,229,500
Photosynthesis and Respiration	45	9,688,798	13	1,787,356	2	190,000
Plant Genetic Mechanisms	91	22,943,571	21	3,590,150	7	928,350
Plant Genome	95	26,442,223	17	4,038,151	2	286,762
Plant Growth and Development	115	25,503,372	23	3,388,000	12	2,120,000
Plant Pathology	112	25,137,553	18	2,884,711	14	2,133,104
Weed Biology and Management	36	6,874,819	9	1,312,188	0	0
Rice Genome	6	44,621,593	2	2,000,000	0	0
Subtotal	791	223,030,468	143	25,071,390	70	10,593,057
MARKETS, TRADE, AND POLICY						
Markets and Trade	74	9,892,483	21	1,824,000	3	185,909
Rural Development	53	10,970,004	10	1,230,000	4	470,000
Subtotal	127	20,862,487	31	3,054,000	7	655,909
ENHANCING VALUE AND USE OF AGRICULTURAL AND FOREST PRODUCTS						
Food Characterization/Process/Product Research	126	29,723,759	14	2,145,000	12	1,619,541
Non-Food Characterization/Process/Product Research	76	16,414,345	12	1,619,605	5	725,000
Subtotal	202	46,138,104	26	3,764,605	17	2,344,541
OTHER						
Agricultural Systems	73	20,539,507	6	1,398,329	10	2,109,037
Strengthening Programs	236	10,172,665	33	1,291,603	55	2,134,932
Subtotal	309	30,712,172	39	2,689,932	65	4,243,969
AWARDS TO BE DETERMINED						880,713
TOTAL[1]	2736	696,711,676	422	69,145,973	257	41,308,529

[1]An additional $100,000 was used for co-sponsorship of the NSF/DOE/USDA *Arabidopsis* Genome Sequencing Project.

November 24, 1999

Performing Organization	Proposals Received	Dollars Requested	Grants Awarded in 1999	Dollars Awarded in 1999
1862 Land-Grant Universities	1696	475,708,694	304	50,214,583
1890 Land-Grant Universities	49	16,397,581	2	74,885
Non Land-Grant Public University or College	380	91,653,609	51	7,751,743
Private University or College	141	$30,263,692	25	$4,402,942
Private Non-Profit	91	31,602,100	21	3,472,393
Private For-Profit	27	7,134,710	2	520,150
State, Local, or Tribal Government	5	1,046,935	0	0
USDA Agency	93	23,983,985	12	2,068,145
Other Federal Agency/Department	33	8,977,983	2	310,000
Individual	20	1,747,197	0	0
Other	21	8,215,210	3	331,172
TOTAL	2736	696,711,676	422	69,145,973

November 23, 1999

For Proposals Awarded Using FY 1998 Funds[1]

Performing Organization	Grants Awarded in 1999	Dollars Awarded in 1999
1862 Land-Grant Universities[2]	220	32,859,252
1890 Land-Grant Universities	5	399,493
Non Land-Grant Public University or College[3]	41	4,271,739
Private University or College[4]	13	$1,485,580
Private Non-Profit[5]	10	1,509,379
Private For-Profit	1	81,620
State, Local, or Tribal Government	0	0
USDA Agency	7	959,946
Other Federal Agency/Department	3	311,050
Individual	0	0
Other	1	90,000
TOTAL	301	41,968,269

[1]Awarded to proposals submitted in FY 1998 except as indicated
[2]Includes $1,192,155 awarded to proposals submitted in FY 1999
[3]Includes $87,248 awarded to proposals submitted in FY 1999
[4]Includes $110,000 awarded to a proposal submitted in FY 1999
[5]Includes $294,679 awarded to proposals submitted in FY 1999

Table 5
National Research Initiative Competitive Grants

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
ALASKA		
University of Alaska Fairbanks		467,500
ALABAMA		
Auburn University	456,000	403,930
Tuskegee University	50,000	
Subtotal	506,000	403,930
ARKANSAS		
University of Arkansas, Fayetteville	577,560	462,337
University of Arkansas, Pine Bluff	49,493	
Subtotal	627,053	462,337
ARIZONA		
Arizona State University	158,664	215,356
Northern Arizona University	90,000	
The University of Arizona	834,020	1,498,000
Subtotal	1,082,684	1,713,356
CALIFORNIA		
Agricultural Research Service, USDA		230,000
Beckman Research Institute	200,000	
California State University	50,000	
California State University, Fresno	98,000	
Forest Service, USDA		180,000
Mills College	83,381	
San Francisco State University		237,000
Stanford University		509,482
The Salk Institute for Biological Studies	190,000	520,150
University of California, Berkeley	300,000	947,500
University of California, Davis	2,084,522	3,409,034
University of California, Irvine	270,000	404,000
University of California, Los Angeles	398,000	1,019,000
University of California, Riverside	804,020	1,209,000
University of California, San Diego	270,000	120,000
University of California, Santa Barbara	180,000	
University of California, Santa Cruz		125,000
Weaver Industries, Inc.	81,820	
Subtotal	5,009,743	8,910,166
COLORADO		
Agricultural Research Service, USDA	750,000	130,000
Colorado State University	425,000	450,000
University of Colorado	60,000	
University of Colorado Health Sciences Center		275,000
University of Denver (Colorado Seminary)		58,460
Subtotal	1,235,000	913,460

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
CONNECTICUT		
The Connecticut Agricultural Experiment Station	110,000	343,000
The University of Connecticut	640,000	696,898
Wesleyan University		50,000
Yale University	120,000	
Subtotal	870,000	1,089,898
DISTRICT OF COLUMBIA		
Carnegie Institution of Washington	105,000	
Economic Research Service, USDA		40,000
Subtotal	105,000	40,000
DELAWARE		
University of Delaware	639,533	1,080,000
FLORIDA		
University of Central Florida	160,000	
University of Florida	1,991,635	490,029
University of South Florida	105,000	
Subtotal	2,256,635	490,029
GEORGIA		
Agricultural Research Service, USDA	109,020	241,756
Institute of Paper Science and Technology		160,000
The University of Georgia	844,704	1,285,000
Subtotal	953,724	1,686,756
HAWAII		
Hawaii Pacific University		130,103
University of Hawaii	700,643	558,613
Subtotal	700,643	688,716
IOWA		
Iowa State University of Science and Technology	1,699,879	3,033,000
The University of Iowa	138,584	296,416
University of Northern Iowa		45,000
Subtotal	1,838,463	3,374,416
IDAHO		
Idaho State University	119,678	
University of Idaho	360,120	410,500
Subtotal	479,798	410,500

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
ILLINOIS		
Agricultural Research Service, USDA	475,000	938,000
Southern Illinois University at Carbondale	100,000	
The University of Chicago	190,000	
University of Health Sciences/The Chicago Medical School		182,000
University of Illinois	485,000	1,953,268
University of Illinois at Chicago		160,000
Western Illinois University		24,855
Subtotal	1,250,000	3,258,123
INDIANA		
Indiana University		895,000
Purdue University	539,000	300,000
University of Notre Dame		870,000
Subtotal	539,000	2,065,000
KANSAS		
Kansas State University	710,000	710,000
University of Kansas	110,000	
University of Kansas Medical Center		190,000
Subtotal	820,000	900,000
KENTUCKY		
University of Kentucky	161,000	420,000
LOUISIANA		
Louisiana State University Agricultural Center	180,000	333,000
Louisiana State University Medical Center	200,000	
Louisiana State University and A&M College	235,000	
Subtotal	615,000	333,000
MASSACHUSETTS		
Harvard University		210,000
Tufts University	270,000	625,000
University of Massachusetts		905,000
Wellesley College	97,692	138,000
Subtotal	367,692	1,878,000
MARYLAND		
Agricultural Research Service, USDA	185,926	205,000
Federation of American Societies for Experimental Biology	4,679	20,081
The Institute for Genomic Research	150,000	1,150,000
University of Maryland	540,000	100,000
Subtotal	880,605	1,475,081
MAINE		
University of Maine at Orono	246,000	500,529

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
MICHIGAN		
Michigan State University	996,812	1,357,161
Michigan Technological University	243,219	445,500
The University of Michigan		440,000
Subtotal	1,240,031	2,242,661
MINNESOTA		
Mayo Foundation	286,000	
University of Minnesota	1,025,896	545,938
Subtotal	1,311,896	545,938
MISSOURI		
Southwest Missouri State University	14,722	
Truman State University		100,000
University of Missouri	535,000	1,323,000
University of Missouri - Rolla		44,110
Washington University	110,000	350,000
Subtotal	659,722	1,817,110
NORTHERN MARIANAS		
Northern Marianas College	7,125	
MISSISSIPPI		
Mississippi State University	202,412	500,575
The University of Mississippi		140,000
The University of Mississippi Medical Center		263,000
Tougaloo College		50,000
Subtotal	202,412	953,575
MONTANA		
Montana State University	617,378	935,076
Montana State University-Bozeman	78,000	
The University of Montana	59,508	89,605
Subtotal	754,886	1,024,681
NORTH CAROLINA		
Duke University	105,000	410,000
Forest Service, USDA		130,000
North Carolina State University	1,501,384	1,755,895
University of North Carolina, Charlotte	96,000	
University of North Carolina, Chapel Hill	90,000	216,000
University of North Carolina, Greensboro	99,571	111,336
Warren Wilson College		90,000
Western Carolina University		180,074
Subtotal	1,891,955	2,893,305

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
NORTH DAKOTA		
North Dakota State University	306,728	479,500
University of North Dakota	80,000	
Subtotal	386,728	479,500
NEBRASKA		
University of Nebraska - Lincoln	833,338	730,000
NEW HAMPSHIRE		
The Trustees of Dartmouth College	105,000	90,000
University of New Hampshire	279,945	49,998
Subtotal	384,945	139,998
NEW JERSEY		
Rutgers, The State University of New Jersey	182,000	471,172
University of Medicine and Dentistry of New Jersey	200,000	
Subtotal	382,000	471,172
NEW MEXICO		
National Center for Genome Resources		60,000
New Mexico State University		250,000
Subtotal		310,000
NEVADA		
University of Nevada, Las Vegas	140,000	180,000
University of Nevada, Reno	120,000	160,000
Subtotal	260,000	340,000
NEW YORK		
Boyce Thompson Institute for Plant Research, Inc.	290,000	440,000
Cold Spring Harbor Laboratory		210,000
Columbia University in the City of New York		365,000
Cornell University	125,000	1,671,522
Rensselaer Polytechnic Institute		70,000
SUNY College of Environmental Science and Forestry	110,000	100,000
State University of New York at Binghamton	105,000	
State University of New York at Stony Brook	90,000	
State University of New York at Buffalo		160,000
The Research Foundation of City University of New York		120,000
Subtotal	720,000	3,136,522
OHIO		
The Ohio State University	130,000	725,000
The University of Akron		175,000
University of Cincinnati		107,000
The University of Toledo	298,000	
Subtotal	428,000	1,007,000

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
OKLAHOMA		
Oklahoma State University	1,157,000	480,000
The University of Tulsa	64,507	
Subtotal	1,221,507	480,000
OREGON		
Oregon Health Sciences University		215,000
Oregon State University	800,213	1,081,456
Subtotal	800,213	1,296,456
PENNYSLVANIA		
Agricultural Research Service, USDA		245,000
Carnegie Mellon University	180,000	
Philadelphia College of Textiles and Science	50,000	1,305,000
The Pennsylvania State University		
University of Pennsylvania		1,025,000
University of Pittsburgh		199,500
Subtotal	230,000	2,774,500
RHODE ISLAND		
Brown University		130,000
University of Rhode Island	99,532	908,820
Gordon Research Center, c/o University of Rhode Island		38,448
Subtotal	99,532	1,077,268
SOUTH CAROLINA		
Clemson University	203,251	1,794,990
University of South Carolina	51,651	
Subtotal	254,902	1,794,990
SOUTH DAKOTA		
South Dakota State University	130,000	317,355
TENNESSEE		
East Tennessee State University	90,000	
Tennessee State University		74,865
The University of Tennessee, Knoxville	222,000	1,297,500
Subtotal	312,000	1,372,365
TEXAS		
Agricultural Research Service, USDA		8,389
Baylor College of Medicine		262,500
Southwest Texas State University		60,000
Texas A&M University	585,253	692,701
Texas A&M University System		766,370
Texas Tech University		200,000
The University of Texas at Austin		470,000
University of North Texas		142,000

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
TEXAS (Continued)		
William Marsh Rice University	115,000	
West Texas A&M University		24,822
Subtotal	700,253	2,626,782
UTAH		
Brigham Young University	100,000	
Forest Service, USDA	120,000	
University of Utah		531,615
Utah State University	310,000	1,124,959
Subtotal	530,000	1,656,574
VIRGINIA		
Virginia Commonwealth University	65,000	
Virginia Polytechnic Institute and State University	379,706	1,519,483
Subtotal	444,706	1,519,483
VERMONT		
University of Vermont and State Agricultural College	200,737	332,000
WASHINGTON		
U.S. Department of Commerce, Northwest Fisheries Science Center	150,000	
University of Washington	225,000	444,500
Washington State University	843,188	1,519,000
Subtotal	1,218,188	1,963,500
WISCONSIN		
Forest Service, USDA	81,060	
Michael Fields Agricultural Institute, Inc.		380,000
Society for the Study of Reproduction Inc.		16,000
University of Wisconsin-Madison	1,169,518	2,514,351
University of Wisconsin-Milwaukee	196,142	100,000
Subtotal	1,446,720	3,010,351
WEST VIRGINIA		
West Virginia University	700,000	117,090
WYOMING		
University of Wyoming	32,900	155,000

State/Recipient	Fiscal Year 98 Awarded in 99	Fiscal Year 99 Awarded in 99
Unobligated Balance		41,736,620
Federal Administration		4,707,026
Unobligated Federal Administration		1,805,029
Unobligated Small Business Innovation Research		990,688
Small Business Innovation Research		5,207,898
Biotechnology Risk Assessment		231,850
Reimbursable Agreement		100,000
Grants awarded in FY 99 from FY 98 funds		38,968,269
Peer Panel Costs		878,448
Total		$163,771,801

TABLE 6
PAYMENTS TO HIGHER EDUCATION PROGRAMS
FISCAL YEAR 1999

STATE	INSTITUTION	1890 CAPACITY BUILDING GRANTS Research	Teaching	Total	1994 ENDOWMENT FUND	CHALLENGE GRANTS	SECONDARY CHALLENGE GRANTS	HISPANIC SERVING INSTITUTIONS	MULTICULTURAL SCHOLARS PROGRAM	NATIONAL NEEDS GRADUATE FELLOWSHIPS	TRIBAL COLLEGES EDUCATION EQUITY	TOTAL FEDERAL FUNDS
ALABAMA	Alabama A&M University	453,728	358,382	812,110	- -	- -	- -	- -	- -	- -	- -	812,110
	Tuskegee University	397,908	359,538	757,447	- -	- -	- -	- -	- -	- -	- -	757,447
ARIZONA	Dine College	- -	- -	- -	58,333	- -	- -	- -	- -	- -	51,733	110,065
	Arizona State University	- -	- -	- -	- -	88,420	- -	- -	- -	- -	- -	88,420
	Maricopa County Regional School District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Valley Unified School, Santa Cruz District #35	- -	- -	- -	- -	- -	14,853	- -	- -	- -	- -	14,853
ARKANSAS	University of Arkansas, Pine Bluff	- -	197,475	197,475	- -	- -	- -	- -	- -	- -	- -	197,475
	University of Arkansas, Fayetteville	- -	- -	- -	- -	78,211	- -	- -	- -	- -	- -	78,211
CALIFORNIA	California Polytechnic State University Foundation	- -	- -	- -	- -	250,000	- -	- -	80,000	- -	- -	330,000
	California State University, Fresno	- -	- -	- -	- -	- -	- -	299,934	- -	- -	- -	299,934
	California State University, Los Angeles	- -	- -	- -	- -	90,000	- -	- -	- -	- -	- -	90,000
	California State University, Northridge	- -	- -	- -	- -	- -	- -	299,182	- -	- -	- -	299,182
	D-Q University	- -	- -	- -	11,291	- -	- -	- -	- -	- -	51,733	63,024
	Mi tan Antonio College	- -	- -	- -	- -	- -	- -	297,045	- -	- -	- -	297,045
	Porterville College	- -	- -	- -	- -	- -	- -	99,549	- -	- -	- -	99,549
	University of California, Davis	- -	- -	- -	- -	89,079	- -	- -	- -	- -	- -	89,079
COLORADO	Colorado State University	- -	- -	- -	- -	88,717	- -	- -	- -	- -	- -	88,717
	Trinidad State Junior College	- -	- -	- -	- -	- -	- -	148,229	- -	- -	- -	148,229
	Weld County School District RE-1	- -	- -	- -	- -	- -	13,140	- -	- -	- -	- -	13,140
CONNECTICUT	University of Connecticut	- -	- -	- -	- -	105,728	- -	- -	- -	- -	- -	105,728
DELAWARE	Delaware State University	- -	179,100	179,100	- -	- -	- -	- -	- -	- -	- -	179,100
	Smyrna School District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
FLORIDA	Florida A&M University	- -	198,988	198,988	- -	- -	- -	- -	- -	- -	- -	198,988
	Miami-Dade Community College	- -	- -	- -	- -	- -	- -	150,000	- -	- -	- -	150,000
	University of Florida	- -	- -	- -	- -	100,000	- -	- -	50,000	- -	- -	150,000
GEORGIA	Fort Valley State College	758,917	86,408	845,325	- -	- -	- -	- -	- -	- -	- -	845,325
	University of Georgia	- -	- -	- -	- -	89,998	- -	- -	- -	- -	- -	89,998
HAWAII	University of Hawaii	- -	- -	- -	- -	- -	- -	- -	97,980	- -	- -	97,980
ILLINOIS	University of Illinois	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	Illinois State University	- -	- -	- -	- -	88,614	- -	- -	- -	- -	- -	88,614
	Southern Illinois University	- -	- -	- -	- -	89,190	- -	- -	- -	- -	- -	89,190
	Thornton Township Highschool District 205	- -	- -	- -	- -	- -	13,480	- -	- -	- -	- -	13,480
	J Sterling Morton High school	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Pekaland Community Unit School District #10	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
INDIANA	Purdue University	- -	- -	- -	- -	143,779	- -	- -	- -	- -	- -	143,779
	Star Academy	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
IOWA	Iowa State University	- -	- -	- -	- -	311,538	- -	- -	75,000	- -	- -	386,538
	Kuna Community School District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Wall Lake View Auburn Comm School District	- -	- -	- -	- -	- -	12,356	- -	- -	- -	- -	12,356
	Sibley-Ocheyedan Community School	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Rudd-Rockford-Marble Rock Comm School	- -	- -	- -	- -	- -	6,000	- -	- -	- -	- -	6,000
	Montezuma High School	- -	- -	- -	- -	- -	2,973	- -	- -	- -	- -	2,973
KANSAS	Haskell Indian Nations University	- -	- -	- -	37,791	- -	- -	- -	- -	- -	51,733	89,524
	Unified School District 227	- -	- -	- -	- -	- -	14,950	- -	- -	- -	- -	14,950
	USD 9307 Ell-Saline	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
KENTUCKY	Kentucky State University	253,243	177,010	430,253	- -	- -	- -	- -	- -	- -	- -	430,253
	McCreary Central High Ag Dept	- -	- -	- -	- -	- -	12,000	- -	- -	- -	- -	12,000
	Hickman County School District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
LOUISIANA	Southern University	281,143	355,374	636,516	- -	- -	- -	- -	- -	- -	- -	636,516
MAINE	Maine School District #19	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
MARYLAND	University of Maryland-Eastern Shore	289,024	179,860	478,884	- -	- -	- -	- -	- -	- -	- -	478,884
MICHIGAN	Bay Mills Community College	- -	- -	- -	14,330	- -	- -	- -	- -	- -	51,733	66,063
	Michigan State University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	Huron School District	- -	- -	- -	- -	- -	1,402	- -	- -	- -	- -	1,402
MINNESOTA	Fond du Lac Tribal and Community College	- -	- -	- -	10,881	- -	- -	- -	- -	- -	51,743	62,724
	Leech Lake Tribal College	- -	- -	- -	15,528	- -	- -	- -	- -	- -	51,733	67,261
	University of Minnesota	- -	- -	- -	- -	147,490	- -	- -	- -	- -	- -	147,490
MISSISSIPPI	Alcorn State University	156,836	340,458	497,294	- -	- -	- -	- -	- -	- -	- -	497,294

TABLE 6
PAYMENTS TO HIGHER EDUCATION PROGRAMS
FISCAL YEAR 1999

STATE	INSTITUTION	1890 CAPACITY BUILDING GRANTS Research	Teaching	Total	1994 ENDOWMENT FUND	CHALLENGE GRANTS	SECONDARY CHALLENGE GRANTS	HISPANIC SERVING INSTITUTIONS	MULTICULTURAL SCHOLARS PROGRAM	NATIONAL NEEDS GRADUATE FELLOWSHIPS	TRIBAL COLLEGES EDUCATION EQUITY	TOTAL FEDERAL FUNDS
MISSOURI	Fanchonne College	- -	- -	- -	- -	- -	- -	- -	80,000	- -	- -	80,000
	Lincoln University	- -	153,905	153,905	- -	- -	- -	- -	- -	- -	- -	153,905
	University of Missouri	- -	- -	- -	- -	89,950	- -	- -	100,000	- -	- -	189,950
MONTANA	Blackfeet Community College	- -	- -	- -	53,169	- -	- -	- -	- -	- -	51,733	73,902
	Carmel High School	- -	- -	- -	- -	- -	8,100	- -	- -	- -	- -	8,100
	Dull Knife Memorial College	- -	- -	- -	14,173	- -	- -	- -	- -	- -	51,733	65,906
	Fort Belknap College	- -	- -	- -	14,265	- -	- -	- -	- -	- -	51,733	65,998
	Fort Peck Community College	- -	- -	- -	20,048	- -	- -	- -	- -	- -	51,733	71,781
	Little Big Horn College	- -	- -	- -	15,401	- -	- -	- -	- -	- -	51,733	67,134
	Montana State University	- -	- -	- -	- -	223,888	- -	- -	- -	- -	- -	223,888
	Salish Kootenai College	- -	- -	- -	60,313	90,800	- -	- -	- -	- -	51,733	182,046
	Stone Child College	- -	- -	- -	17,152	- -	- -	- -	- -	- -	51,733	68,885
NEBRASKA	Nebraska Indian Community College	- -	- -	- -	14,384	- -	- -	- -	- -	- -	51,733	66,087
	University of Nebraska, Lincoln	- -	- -	- -	- -	137,792	- -	- -	- -	- -	- -	137,792
	Little Priest Tribal College	- -	- -	- -	10,367	- -	- -	- -	- -	- -	51,733	62,100
NEW JERSEY	Rutgers University	- -	- -	- -	- -	89,324	- -	- -	- -	- -	- -	89,324
NEW MEXICO	Crownpoint Institute of Technology	- -	- -	- -	22,373	- -	- -	- -	- -	- -	51,733	74,105
	Eastern New Mexico University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	Institute of American Arts	- -	- -	- -	12,561	- -	- -	- -	- -	- -	51,733	64,294
	New Mexico State University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	University of New Mexico	- -	- -	- -	- -	- -	- -	299,989	- -	- -	- -	299,989
	Southwestern Indian Polytechnic Institute	- -	- -	- -	35,383	- -	- -	- -	- -	- -	51,733	87,115
NEW YORK	Cornell University	- -	- -	- -	- -	179,752	- -	- -	100,000	- -	- -	279,752
	Corry, on behalf of Lehman College	- -	- -	- -	- -	- -	- -	238,007	- -	- -	- -	238,007
	Bronx Community College, Bronx, New York	- -	- -	- -	- -	- -	- -	300,000	- -	- -	- -	300,000
	Research Foundation/State U of New York	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	South Jefferson Central School	- -	- -	- -	- -	- -	14,070	- -	- -	- -	- -	14,070
	Genesee-Livingston-Steuben Coop Service	- -	- -	- -	- -	- -	14,022	- -	- -	- -	- -	14,022
	Yorkshire-Pioneer Central School	- -	- -	- -	- -	- -	13,780	- -	- -	- -	- -	13,780
NORTH CAROLINA	North Carolina A&T State University	- -	703,967	703,967	- -	- -	- -	- -	- -	- -	- -	703,967
	North Carolina State University	- -	- -	- -	- -	96,605	- -	- -	- -	- -	- -	96,605
	East Carolina University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
	Southern Nash Senior High School	- -	- -	- -	- -	- -	14,966	- -	- -	- -	- -	14,966
	Franklinton High School	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Northeastern High School	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Nash-Rocky Mount Schools	- -	- -	- -	- -	- -	14,995	- -	- -	- -	- -	14,995
	North Stokes High School	- -	- -	- -	- -	- -	13,394	- -	- -	- -	- -	13,394
	Carteret County Board Schools	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Alamance Burlington Schools	- -	- -	- -	- -	- -	3,402	- -	- -	- -	- -	3,402
NORTH DAKOTA	Fort Berthold Community College	- -	- -	- -	15,584	- -	- -	- -	- -	- -	51,733	67,317
	Cankdeska Cikana Community College	- -	- -	- -	13,620	- -	- -	- -	- -	- -	51,733	65,361
	North Dakota State University	- -	- -	- -	- -	90,000	- -	- -	- -	- -	- -	90,000
	Sitting Bull College	- -	- -	- -	17,840	- -	- -	- -	- -	- -	51,733	69,573
	Turtle Mountain Community College	- -	- -	- -	28,017	- -	- -	- -	- -	- -	51,733	79,750
	university of North Dakota	- -	- -	- -	- -	- -	- -	- -	95,000	- -	- -	95,000
	United Tribes Technical College	- -	- -	- -	29,889	- -	- -	- -	- -	- -	51,733	81,622
OHIO	Ohio State University	- -	- -	- -	- -	498,321	- -	- -	- -	- -	- -	498,321
OKLAHOMA	Langston University	880,000	280,000	860,000	- -	- -	- -	- -	- -	- -	- -	860,000
	Northeastern State University	- -	- -	- -	- -	- -	- -	- -	70,000	- -	- -	70,000
	Oklahoma State University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
OREGON	Oregon State University	- -	- -	- -	- -	189,002	- -	- -	- -	- -	- -	189,002
	Port Orford-Langlois District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
	Multnomah County School District #7	- -	- -	- -	- -	- -	14,990	- -	- -	- -	- -	14,990
	Canby School District #86	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
PENNSYLVANIA	State College Area School District	- -	- -	- -	- -	- -	14,744	- -	- -	- -	- -	14,744
PUERTO RICO	Interamerican University of Puerto Rico	- -	- -	- -	- -	- -	- -	150,000	- -	- -	- -	150,000
	Colegio Universitario del Puerto Rico	- -	- -	- -	- -	- -	- -	295,690	- -	- -	- -	295,690
RHODE ISLAND	University of Rhode Island	- -	- -	- -	- -	88,849	- -	- -	100,000	- -	- -	188,849

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PAYMENTS TO HIGHER EDUCATION PROGRAMS
FISCAL YEAR 1999

STATE	INSTITUTION	1890 CAPACITY BUILDING GRANTS Research	Teaching	Total	1994 ENDOWMENT FUND	CHALLENGE GRANTS	SECONDARY CHALLENGE GRANTS	HISPANIC SERVING INSTITUTIONS	MULTICULTURAL SCHOLARS PROGRAM	NATIONAL NEEDS GRADUATE FELLOWSHIPS	TRIBAL COLLEGES EDUCATION EQUITY	TOTAL FEDERAL FUNDS
SOUTH CAROLINA	South Carolina State University	161,792	333,856	495,648	- -	- -	- -	- -		- -	- -	495,648
	Clemson University	- -	- -	- -	- -	- -	- -	- -	100,000	- -	- -	100,000
SOUTH DAKOTA	Cheyenne River Community College	- -	- -	- -	11,115	- -	- -	- -	- -	- -	51,733	64,848
	Oglala Lakota College	- -	- -	- -	39,601	- -	- -	- -	- -	- -	51,733	91,334
	Sinte Gleska University	- -	- -	- -	27,046	- -	- -	- -	- -	- -	51,733	78,779
	Sisseton-Wahpeton Community College	- -	- -	- -	12,596	- -	- -	- -	- -	- -	51,733	64,329
	South Dakota State University	- -	- -	- -	- -	85,109	- -	- -	75,000	- -	- -	160,109
TENNESSEE	Tennessee State University	549,645	199,000	748,645	- -	- -	- -	- -	- -	- -	- -	748,645
TEXAS	Prairie View A&M University	- -	180,000	180,000	- -	- -	- -	- -	- -	53,000	- -	233,000
	Southwest Texas State University	- -	- -	- -	- -	89,451	- -	- -	- -	- -	- -	89,451
	Sul Ross State University	- -	- -	- -	- -	- -	- -	150,000	- -	- -	- -	150,000
	Texas Technology University	- -	- -	- -	- -	83,831	- -	- -	- -	- -	- -	83,831
	Texas A&M University, Kingsville (1)	- -	- -	- -	- -	52,500	- -	- -	- -	- -	- -	52,500
	Childress Independent School District	- -	- -	- -	- -	- -	7,460	- -	- -	- -	- -	7,460
	Marcus High School Ag Dept	- -	- -	- -	- -	- -	5,946	- -	- -	- -	- -	5,946
	Judson Independent School District	- -	- -	- -	- -	- -	15,000	- -	- -	- -	- -	15,000
VERMONT	University of Vermont	- -	- -	- -	- -	- -	- -	- -	76,984	- -	- -	76,984
VIRGINIA	Virginia State University	266,645	179,959	446,604	- -	- -	- -	- -	- -	- -	- -	446,604
	Virginia Polytechnic Institute & State University	- -	- -	- -	- -	88,248	- -	- -	100,000	- -	- -	188,248
WASHINGTON	Northwest Indian College	- -	- -	- -	29,148	- -	- -	- -	- -	- -	51,733	80,881
WISCONSIN	College of the Menominee Nation	- -	- -	- -	14,622	- -	- -	- -	- -	- -	51,733	66,355
	Lac Courte Oreilles Ojibwa Community College	- -	- -	- -	18,825	- -	- -	- -	- -	- -	51,733	70,558
WYOMING	University of Wyoming	- -	- -	- -	- -	12,000	- -	- -	- -	12,000	- -	24,000
	Subtotal	4,255,881	4,366,280	8,622,161	646,731	4,146,206	472,543	2,730,625	1,899,964	65,000	1,552,000	20,135,230
		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Federal Administration	184,000	184,000	368,000	26,947	174,000	20,000	114,000	70,000	- -	- -	772,947
	Small Business	110,400	- -	110,400	- -	- -	- -	- -	- -	- -	- -	110,400
	Biotechnology Risk Assessment	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Peer Panels	18,140	18,141	36,281	- -	29,794	7,457	5,375	11,603	23,000	- -	113,510
	1994 Endowment Fund	- -	- -	- -	4,600,000	- -	- -	- -	- -	- -	- -	4,600,000
	Teaching Awards	6,000	6,000	12,000	- -	- -	- -	- -	4,000	- -	- -	16,000
	FAEIS	26,250	26,250	52,500	- -	- -	- -	- -	17,500	- -	- -	70,000
	Subtotal	4,600,671	4,600,671	9,201,342	5,273,678	4,350,000	500,000	2,850,000	2,003,067	88,000	1,552,000	25,818,087
	Funds carried forward from FY 1998 and FY 1999	- -	- -	- -	- -	- -	- -	- -	- -	2,912,000	- -	2,912,000
	Total	4,600,671	4,600,671	9,201,342	5,273,678	4,350,000	500,000	2,850,000	2,003,067	3,000,000	1,552,000	28,730,087

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Extension Activities:

Payments to States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, Micronesia, Northern Marianas, and American Samoa: For payments for cooperative extension work under the Smith-Lever Act, to be distributed under sections 3(b) and 3(c) of said Act, and under section 208(c) of Public Law 93-471, for retirement and employees' compensation costs for extension agents and for costs of penalty mail for cooperative extension agents and State extension directors, $276,548,000; payments for extension work at the 1994 Institutions under the Smith-Lever Act (7 U.S.C. 343 (b)(3)), [$3,060,000;] $3,500,000; payments for the nutrition and family education program for low-income areas under section 3(d) of the Act, [$58,695,000;] $61,043,000; payments for the pest management program under section 3(d) of the Act, [$10,783,000; payments for the farm safety program under section 3(d) of the Act, $4,000,000;] $12,269,000; payments for pesticide applicator training under section 3(d) of the Act, $1,500,000; payments to upgrade research, extension, and teaching facilities at the 1890 land-grant colleges, including Tuskegee University, as authorized by section 1447 of Public Law 95-113 (7 U.S.C. 3222b), $12,000,000, to remain available until expended; payments for the rural development centers under section 3(d) of the Act, $908,000; payments for youth-at-risk programs under section 3(d) of the Act, [$9,000,000] $10,000,000; for youth farm safety education and certification extension grants, to be awarded competitively under section 3(d) of the Act, $5,000,000; payments for carrying

out the provisions of the Renewable Resources Extension Act of 1978, $3,192,000; payments for Indian reservation agents under section 3(d) of the Act, [$1,714,000;] $5,000,000; payments for sustainable agriculture programs under section 3(d) of the Act, [$3,309,000; payments for rural health and safety education as authorized by section 2390 of Public Law 101-624 (7 U.S.C. 2661 note, 2662), $2,628,000;] $4,500,000; payments for cooperative extension work by the colleges receiving the benefits of the second Morrill Act (7 U.S.C. 321-326 and 328) and Tuskegee University, $26,843,000, of which $1,000,000 shall be made available to West Virginia State College in Institute, West Virginia, which for fiscal year [2000] 2001 and thereafter shall be designated as an eligible institution under section 1444 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3221); and for Federal administration and coordination including administration of the Smith-Lever Act, and the Act of September 29, 1977 (7 U.S.C. 341- 349), and section 1361(c) of the Act of October 3, 1980 (7 U.S.C. 301 note), and to coordinate and provide program leadership for the extension work of the Department and the several States and insular possessions, [$12,242,000;] $5,933,000; in all, [$424,922,000:] $428,236,000: Provided, That funds hereby appropriated pursuant to section 3(c) of the Act of June 26, 1953, and section 506 of the Act of June 23, 1972, shall not be paid to any State, the District of Columbia, Puerto Rico, Guam, or the Virgin Islands, Micronesia, Northern Marianas, and America Samoa prior to availability of an equal sum from non-Federal sources for expenditure during the current fiscal year.

The first change deletes the language for payments for the farm safety program under section 3(d) of the Smith-Lever Act (7 U.S.C. 343).

The second change provides language for funding for payments for pesticide applicator training under section 3(d) of the Smith-Lever Act (7 U.S.C. 343).

The third change provides language for funding of extension grants to be awarded competitively for youth farm safety education and certification under section 3(d) of the Smith-Lever Act (7 U.S.C. 343).

The fourth change deletes the language for payments for rural health and safety education as authorized by section 2390 of Public Law 101-624 (7 U.S.C. 2661 note, 2662).

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

Lead-Off Tabular Statement

Extension Activities

Appropriation Act, 2000	$424,922,000	(A)
Budget Estimate, 2001	428,236,000	
Increase in Appropriation	$3,314,000	

Adjustments in 2000:	
Appropriations Act, 2000	$424,922,000
Rescission Under P.L. 106-113	-748,000
Adjusted base for 2000	$424,174,000
Budget Estimate, Current Law, 2001	428,236,000
Increase from adjusted 2000	+4,062,000

(A) Does not include $120,000 transferred to CSREES of which $56,000 is transfered to this account. The request for Congressional Relations activities is being reflected under the Office of the Assistant Secretary for Congressional Relations.

Summary of Increases and Decreases

Item of Change	2000 Estimated	Pay Cost	Program Changes	2001 Estimated
Extension Activities:				
Smith-Lever Formula 3(b) & (c)	$276,548,000	- -	- -	$276,548,000
1890 Institutions	26,843,000	- -	- -	26,843,000
Smith-Lever 3(d):				
Farm Safety	3,400,000		-$3,400,000	- -
Children/Youth and Families at Risk	9,000,000	- -	+1,000,000	10,000,000
Youth Farm Safety Ed. and Cert.	- -	- -	+5,000,000	5,000,000
Rural Development	908,000	- -	- -	908,000
Sustainable Agriculture	3,309,000	- -	+1,191,000	4,500,000
Pest Management	10,783,000	- -	+1,486,000	12,269,000
Pesticide Applicator Training	- -	- -	+1,500,000	1,500,000
EFNEP	58,695,000	- -	+2,348,000	61,043,000
Extension Indian Reservations Prog.	1,714,000	- -	+3,286,000	5,000,000
Renewable Resources Extension Act	3,192,000	- -	- -	3,192,000
1890 Facilities (Section 1447)	12,000,000	- -	- -	12,000,000
Extension Services at the 1994 Institutions	3,060,000	- -	+440,000	3,500,000
Rural Health	2,628,000		-2,628,000	- -
Federal Administration (General)	11,886,000	- -	-7,099,000	4,787,000
Federal Administration:				
Enhancement of Small Farms Capabilty	- -	- -	+670,000	670,000
Agriculture in the Classroom	208,000	- -	+268,000	476,000
Total Available, Extension Activities	424,174,000	- -	+4,062,000	428,236,000

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

EXTENSION ACTIVITIES

PROJECT STATEMENT

(On basis of appropriation)

(Includes Carryover Balances)

Project	1999 Actual Amount	1999 Actual Staff Year	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease		2001 Estimated Amount	2001 Estimated Staff Years
Extension Activities:								
1. Smith-Lever Act:								
Section 3b&c:								
Program	$269,228,580		$269,228,580		--		$269,228,580	
Federal Admin. (4%)	7,269,419		7,319,420		--		7,319,420	
Subtotal, Section 3b&c	276,497,999		276,548,000		--		276,548,000	
2. Section 3d Program: a/								
EFNEP	58,695,000		58,695,000		+2,348,000	(1)	61,043,000	
Farm Safety	3,000,000		3,400,430		-3,400,430	(2)	--	
Pest Management	10,783,000		10,783,000		+1,486,000	(3)	12,269,000	
Rural Development Ctrs	908,000		908,000		--		908,000	
Children/Youth and Families at Risk	9,000,000		9,000,000		+1,000,000	(4)	10,000,000	
Youth Farm Safety Education and Certification	--		--		+5,000,000	(5)	5,000,000	
Indian Reservations	1,714,000		1,714,000		+3,286,000	(6)	5,000,000	
Pesticide Applicator Training	--		--		+1,500,000	(7)	1,500,000	
Sustainable Agriculture	3,309,000		3,309,000		+1,191,000	(8)	4,500,000	
Subtotal, Section 3d	87,409,000		87,809,430		+12,410,570		100,220,000	
Total, Smith-Lever Act	363,906,999		364,357,430		+12,410,570		376,768,000	
3. Payment to 1890 Colleges and Tuskegee University	24,809,280		25,769,280		--		25,769,280	
Federal Admin. (4%)	1,033,720		1,073,720		--		1,073,720	
Subtotal	25,843,000		26,843,000		--		26,843,000	
4. Payments under Renewable Resources Act	3,192,000		3,192,000		--		3,192,000	
5. Payments to Rural Health/Safety	2,628,000		2,628,000		-2,628,000	(9)	--	
6. 1890 Facilities (Sec 1447)	7,319,286		12,000,000		--		12,000,000	
Carryover	--		2,824,679		-2,824,679		--	
7. Extension Services at the 1994 Institutions	2,060,000		3,060,000		+440,000	(10)	3,500,000	
8. Federal Administration and Coordination (Direct Appropriation):								
General	4,787,000		4,736,000		+721,000		5,457,000	
Ag in the Classroom	208,000		208,000		+268,000		476,000	
Beef producers improve (AR)	197,000		197,000		-197,000		--	
Botanical Garden initiative (IL)	--		106,263		-106,263		--	
Conservation technology transfer (WI)	--		170,022		-170,022		--	
Delta teachers academy	3,500,000		3,500,000		-3,500,000		--	

Project	1999 Actual Amount	1999 Actual Staff Year	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
Diabetes detection, prevention (WA)	550,000		550,000		-550,000	--	
Extension specialist (AR)	99,000		--		--	--	
Extension specialist (MS)	100,000		100,000		-100,000	--	
Income enhancement demo (OH)	246,000		246,000		-246,000	--	
Integrated cow/calf mgmt. (IA)	300,000		250,000		-250,000	--	
National center for agriculture safety (IA)	195,000		195,000		-195,000	--	
Pilot technology transfer (WI)	163,000		163,000		-163,000	--	
Range improvement (NM)	197,000		197,000		-197,000	--	
Rural development (AK)	--		276,285		-276,285	--	
Rural development (NM)	280,000		280,000		-280,000	--	
Rural development (OK)	150,000		150,000		-150,000	--	
Rural rehabilitation (GA)	246,000		246,000		-246,000	--	
Technology transfer (OK, MS)	326,000		326,000		-326,000	--	
Wood biomass/alternative farm product (NV)	197,000		197,000		-197,000	--	
Subtotal	11,741,000		12,093,570		-6,160,570 (11a-c)	5,933,000	
Program Set-asides (non-add)	[1,947,920]		[2,146,897]		[+208,903]	[2,355,800]	
Total Extension Activities obligations estimate	416,690,285	193	426,998,679	210	+1,237,321	428,236,000	205
Unobligated Balance:							
Available, start of year	-1,717,965		-2,824,679		+2,824,679	--	
Lapsing	50,001		--		--	--	
Available, end of year	2,824,679		--		--	--	
Total, Appropriation	417,847,000	193	424,174,000	210	+4,062,000	428,236,000	205

a/ Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 authorizes an integrated research, education, and extension competitive grants program. Water Quality, Food Safety, and Pesticide Impact Assessment Smith Lever 3(d) programs previously shown on the extension activities project statement are now reflected on the integrated activities project statement.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

EXTENSION ACTIVITIES

PROJECT STATEMENT

(On basis of appropriation)

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Extension Activities:				
1. Smith-Lever Act:				
Section 3b&c:				
Program	$269,228,580	$269,228,580	--	$269,228,580
Federal Admin. (4%)	7,319,420	7,319,420	--	7,319,420
Subtotal, Section 3b&c	276,548,000	276,548,000	--	276,548,000
2. Section 3d Program: a/				
EFNEP	58,695,000	58,695,000	--	58,695,000
Farm Safety	3,000,000	4,000,000	-599,570	3,400,430
Pest Management	10,783,000	10,783,000	--	10,783,000
Rural Development Ctrs.	908,000	908,000	--	908,000
Children/Youth and Families at Risk	9,000,000	9,000,000	--	9,000,000
Indian Reservations	1,714,000	1,714,000	--	1,714,000
Pesticide Applicator Training	--	--	--	--
Sustainable Agriculture	3,309,000	3,309,000	--	3,309,000
Subtotal, Section 3d	87,409,000	88,409,000	-599,570	87,809,430
Total, Smith-Lever Act	363,957,000	364,957,000	-599,570	364,357,430
3. Payment to 1890 Colleges and Tuskegee University	24,809,280	25,769,280	--	25,769,280
Federal Admin. (4%)	1,033,720	1,073,720	--	1,073,720
Subtotal	25,843,000	26,843,000	--	26,843,000
4. Payments under Renewable Resources Act	3,192,000	3,192,000	--	3,192,000
5. Payments to Rural Health/Safety	2,628,000	2,628,000	--	2,628,000
6. 1890 Facilities (Sec 1447)	8,426,000	12,000,000	--	12,000,000
Carryover	--	--	--	--
7. Extension Services at the 1994 Institutions	2,060,000	3,060,000	--	3,060,000
8. Federal Administration and Coordination (Direct Appropriation):				
General	4,787,000	4,787,000	-51,000	4,736,000
Ag in the Classroom	208,000	208,000	--	208,000
Beef producers improve (AR)	197,000	197,000	--	197,000
Botanical Garden initiative (IL)	--	125,000	-18,737	106,263
Conservation technology transfer (WI)	--	200,000	-29,978	170,022
Delta teachers academy	3,500,000	3,500,000	--	3,500,000
Diabetes detection, prevention (WA)	550,000	550,000	--	550,000
Extension specialist (AR)	99,000	--	--	0
Extension specialist (MS)	100,000	100,000	--	100,000
Income enhancement demo (OH)	246,000	246,000	--	246,000

Project	1999 Appropriation	2000 Appropriation	Reduction	2000 Adjusted
Integrated cow/calf mgmt. (IA)...	300,000	250,000	--	250,000
National center for agriculture safety (IA).....	195,000	195,000	--	195,000
Pilot technology transfer (WI).....	163,000	163,000	--	163,000
Rangeland improvement (NM)....	197,000	197,000	--	197,000
Rural development (AK).....	--	325,000	-48,715	276,285
Rural development (NM).....	280,000	280,000	--	280,000
Rural development (OK).....	150,000	150,000	--	150,000
Rural rehabilitation (GA).....	246,000	246,000	--	246,000
Technology transfer (OK, MS)...	326,000	326,000	--	326,000
Wood biomass/alternative farm product (NY).....	197,000	197,000	--	197,000
Subtotal	11,741,000	12,242,000	-148,430	12,093,570
Program Set-asides (non-add).....	[1,947,920]	[2,170,880]	[-23,983]	[2,146,897]
Total Extension Activities obligations estimate.....	417,847,000	424,922,000	-748,000	424,174,000
Unobligated Balance: Available, start of year.....	--	--	--	--
Lapsing.....	--	--	--	--
Available, end of year.....	--	--	--	--
Total, Appropriation.....	417,847,000	424,922,000	-748,000	424,174,000

a/ Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 authorizes an integrated research, education, and extension competitive grants program. Water Quality, Food Safety, and Pesticide Impact Assessment Smith Lever 3(d) programs previously shown on the extension activities project statement are now reflected on the integrated activities project statement.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

FY 2001 EXPLANATORY NOTES
JUSTIFICATION OF INCREASES AND DECREASES

Extension Activities

(1) An increase of $2,348,000 for Expanded Food and Nutrition Education Program (EFNEP) for the delivery of nutrition education programs to low income populations ($58,695,000 available in fiscal year 2000):

Despite recent increases in income and declines in poverty overall in the U.S., children are still disproportionately likely to be poor. In 1998, children made up only 26 percent of the population, but accounted for 39 percent of the poor. In 1969 when EFNEP began, the child poverty rate was 14 percent, with 9.7 million children below the poverty level. For 1998, the rate was 18.9 percent with nearly 13.5 million children. Thus the vulnerable population for which EFNEP can make a lasting difference has increased, making the problem even more critical today than it was 30 years ago. Poor children are more likely to experience material deprivation and poor health, die during childhood, score lower in standardized tests, be retained in grade, drop out of school, have out-of-wedlock births, experience violent crime, end up as poor adults and suffer other undesirable outcomes.

Research on brain development shows that malnutrition can impair learning. The link is particularly strong for iron deficiency anemia and poor cognitive development. Many of these impairments are permanent; later improvements in iron intake correct the anemia but do not restore lost cognitive development. Over 1 million children in the U.S. have iron deficiency anemia. Data on food insecurity released by USDA shows that about 11.9 million households experienced food insecurity at some level during 1995. Even short-term food shortages, if repeated during the vulnerable early years of childhood, can have permanent negative effects.

EFNEP successfully delivers an educational program which leads to sustainable behavior change. Impact data from the 1998 EFNEP Evaluation Reporting System showed that 89 percent of adults improved nutrition practices, 84 percent improved food resource management practices, and 67 percent improved food safety practices. The benefits are far reaching, not just improvement in the nutrient intake of a vulnerable population, but also building the basic life skills for those moving into the workforce. In addition, the improvements in early childhood nutrition will allow children to achieve their full cognitive development potential. In addition, a cost-benefit study in Tennessee showed that for every $1 spent to implement EFNEP, $2.48 is saved on food expenditures. This can reduce the need for emergency food assistance and save money for other necessities.

This multi-faceted program addresses many USDA and National goals and initiatives, including:

- USDA Civil Rights Action Plan
- President's Initiative on Food Safety
- Secretary's Initiative on Food Security
- President's Initiative on Child Care

In addition to the outcomes listed above, EFNEP also supports objectives under the CSREES Strategic Goal 2, "A Safe and Secure Food and Fiber System," Goal 3, "A Healthier, More Well-Nourished Population," and contributes to Goal 5, "Greater Harmony between Agriculture and the Environment."

(2) A decrease of $3,400,430 to eliminate funding for Farm Safety ($3,400,430 available in fiscal year 2000):

This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer reviewed grants. Alternate funding from formula programs, State and local governments, and private sources could be used to support aspects of this program deemed to be of high priority at State and/or local levels.

(3) An increase of $1,486,000 for Pest Management to extend knowledge and technologies from researchers to farmers ($10,783,000 available in fiscal year 2000):

This program is focused on moving knowledge and technologies from researchers into the hands of farmers as quickly as possible. Alternative pest management strategies are demonstrated and evaluated in commercial production settings to help farmers gain confidence in these new tactics. This program supports a base program in each state that makes it possible to accelerate the transfer of proven IPM methods from researchers to implementation by farmers, crop consultants, and other end-users as they face the transition to FQPA implementation. An IPM coordinator is supported at each land-grant university to develop and coordinate IPM research and extension programs. Agricultural producers, consultants, and other pest managers are provided education and assistance through consultations, clinics, workshops, conferences, demonstrations, field days, seminars, and a wide variety of publications and video publications.

The demonstration of IPM methods at the local level, through projects supported by this program, is essential to ensuring the adoption of these practices. In addition, in order to maintain at least 75 percent of U.S. cropland under some level of IPM, and to increase the level of IPM technology from low level to full scale IPM methods, it is necessary to continue to develop and demonstrate new alternatives for pest control. The increased funding will enable 6-10 new projects to be funded in fiscal year 2001.

This program contributes to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(4) An increase of $1,000,000 for Children, Youth, and Families at Risk to focus on child care ($9,000,000 available in fiscal year 2000):

The Children, Youth, and Families at Risk (CYFAR) program supports community-based programs serving over 70,000 children, youth, and families in at-risk environments in 51 states and U.S. territories. CYFAR also supports CYFERNet, a multi-university web-based collaboration providing program, evaluation, and technology resources and technical assistance to community programs. The CYFERNet website is maintained by a network of professionals from more than 40 universities. It includes program materials, research in relevant child, youth, parent, and community areas, evaluation strategies and instruments, and a wide variety of on-line activities to provide information to staff and participants.

Every day in America 13 million preschool children are in child care arrangements, 24 million school-age youth are in need of programs, and five million youth are left without supervision. The need for quality care arrangements and programs for infants through teens has never been greater. Over the course of their developmental years, millions of American children and youth will spend more time in care arrangements than in formal education. Unfortunately, national studies show that more than two-thirds of all child care programs are poor to mediocre. The lack of quality care impacts the larger societal issues of education, employment, economics and environment.

Through this proposed funding increase, land-grant university faculty will significantly increase efforts to improve affordability, accessibility, quality, and sustainability of programs. As one indicator of meeting the needs of society and stakeholders, the existing National Network for Child Care website which supports these efforts, reaches over 3 million people per year in 130 countries annually. In addition, child care and school-age care is rated as an area of high need in a recent needs assessment of existing CYFAR community site staff. Increased funding would be used to expand the support, training, and technical assistance to programs and staff engaged in child care, school-age care and programs for teens in out-of-school time. Programs would focus on children and families with greatest need, such as: small farm families, migrant workers, low income, isolated rural, inner city poor, people moving from welfare to work, under-educated children and adults, different ethnic populations, and new immigrant families facing language as well as economic and academic challenges to surviving and becoming self-sufficient in America.

(5) An increase of $5,000,000 for Youth Farm Safety Education and Certification to enhance the on-the-job safety of young farm workers (no funding available in fiscal year 2000):

Children working in agriculture face risks of injury and death. Agricultural employment accounts for 43 percent of job-related fatalities of young workers. Tractor-related fatalities account for about one-third of all agricultural fatalities of youth 17 and under. The Fair Labor Standards Act and selected state laws allow child agriculture workers to work at younger ages, for longer hours, and in more hazardous occupations than in other

industries. Minors 16 and 17 years of age are exempt from prohibitions on work in hazardous occupations identified by the Secretary of Labor, and 14 and 15 year old children are exempt from the hazardous occupation restriction if they possess a valid certificate documenting completion of safety training for tractor operation or other machine operation.

This initiative would establish a USDA-administered competitive grants program to States to provide formal safety training and certification targeted to youth age 16-17 years. Grants would also be used for related purposes such as curriculum improvement for current safety programs, and development of new safety education curricula for other agricultural occupations as needed.

The initiative would build on existing delivery systems by Cooperative Extension Service and vocational agriculture programs that have been providing safety training and certifications to youth which allow them to operate tractors and other machinery as hired workers. This initiative will provide funds to land-grant institutions under Section 3(d) of the Smith-Lever Act. Land-grant institutions are permitted to contract with qualified private businesses and community and youth organizations to deliver education and training. Thus, grant funds could reach 4-H, Future Farmers of America, and similar organizations that would provide safety education that prepares youth for safety certification. Students would have to pass both a written and driving exam, and certifications would be issued by an extension agent or a U.S. Office of Education Vocational Agriculture Training program teacher.

Training delivery to hard-to-reach populations, such as youth who have left school, migrant youth, and others with limited access to school-based programs, will be facilitated through partnering among federal agencies, and with state and local agencies. The program is intended to augment state and local vocational agriculture school funds for safety training by agricultural employers and other private businesses. The initiative is intended to enhance the safety of young farm workers, while maintaining their employability in agriculture and minimizing disruptions to farm employers' access to youth workers.

This program contributes to CSREES Strategic Goal 5, "Enhanced Economic Opportunity and Quality of Life for Americans."

(6) An increase of $3,286,000 for Extension Indian Reservations Program to increase the number of extension agents on reservations ($1,714,000 available in fiscal year 2000):

This program supports Extension Agents on large reservations to address the unique needs and problems of Indian tribes. The funds are managed by the 1862 land-grant university in the state in which the reservation is located, providing access to the university's knowledge base and structure to deliver needed information and programs. Under a Memorandum of Understanding, the Tribe provides functional office space, utilities, and an advisory committee. The university provides qualified Extension agents

who are part of, and have access to, resources of the university. The university attempts to recruit qualified Native Americans for these positions. In fiscal year 1999, one-third of the reservation Extension Agents were tribal members. There is a backlog of 17 unfunded applications from ten western states. An additional 37 reservations also are eligible to participate in the program. Current funding levels preclude supporting these projects, which would affect 54 reservations.

Additional funds are needed to provide qualified agents to provide educational programs for agriculture, for agriculture-related youth programs, and for other tribally-identified priorities (e.g., food and nutrition, parenting, financial management, household management, and personal esteem and maintenance).

The proposed level of $5 million would allow full funding to be provided to the current projects and to add 23 additional agents (about one-half of the agents needed to adequately provide non-resident education programs to these isolated and under-served audiences). It also would provide qualified full-time support staff (usually a tribal member) and some para-professional staff to provide linkages to the tribal structure, guidance on political and cultural values, and translation assistance. Such staffing provides entre to tribal social organizations and to volunteers for extension programs and serves as a nucleus for developing local volunteers.

This increase will enhance the USDA outreach to Native American small farmers and will address the recommendations made by the USDA Civil Rights Action Report. This program contributes to CSREES Strategic Goal 5: Enhanced Economic Opportunities and Quality of Life for Citizens and Communities.

(7) An increase of $1,500,000 for Pesticide Applicator Training (PAT) to educate restricted-use pesticide users on safe and environmentally sound methods of pesticide application (no funding available in fiscal year 2000);

Pesticide applicators who desire to use restricted use pesticides must be trained and certified before they may purchase and use these products. The EPA proposed the restricted use classification of pesticides in the amended FIFRA (1972) as a risk reduction measure. Training and certifying applicators in their use allows the continued use of pesticides that may otherwise pose a health hazard to users, consumers and the environment, and thus be canceled or banned by EPA. FQPA's risk cup analysis criteria may impact continued registrations of critical pesticides used by agricultural producers. PAT, a risk reduction and mitigation program, can reduce pesticide exposure to applicators and the environment, thereby minimizing the risk cup effect, and allowing for continued registrations of critical pesticides.

Users of restricted use pesticides are certified either as private applicators (farmers) or commercial applicators (all others, including agricultural aviators and pest control

operators). The number of restricted use pesticides that are classified as such by the EPA has increased from slightly over 20 in 1978 to over 120 in 1994. The states may also classify pesticides as restricted.

Pesticides are one of the most important tools in production agriculture, enabling farmers and ranchers to control pests such as insects, weeds and diseases. Their use has made it possible for American agriculture to lead the world in producing food and fiber. Pesticides also play an important role in public health in control of nuisance pests and disease vectors such as mosquitoes. Homeowners routinely use pesticides for pest control in and around the home. Properly used pesticides have contributed immensely to our quality of life, as well as helping provide food and fiber to the world.

Concerns over environmental protection, safe use, food safety and the reliability of the food supply have resulted in national and state regulations in the use of pesticides that impact producers and ultimately consumers. Pesticide education for the general public and training of applicators are essential to assure sustainable farm enterprises and to provide a bountiful, safe and affordable food and fiber supply. Educational and training programs to address these concerns are the focus of PAT programs for both producers and consumers.

The PAT program is a unique collaborative program between USDA and EPA. The purpose is to educate restricted-use pesticide users on safe and environmentally sound methods of pesticide application. Environmental concerns over the use of pesticides and products stewardship from the point of sale to use and disposal are key elements in teaching plans and educational materials developed by the state extension services for pesticide education and PAT programs. The PAT program conducted by state extension staff may also provide a link between agricultural producers and regulatory initiatives, such as workers' protection. Farmers, especially small operators, often do not have the resources necessary to help them understand and comply with complicated regulatory documents. The pesticide coordinator, through PAT, is able to interact with these growers and producers and help them to comply with these existing regulatory initiatives.

The PAT program also offers training in IPM practices to growers, commercial applicators and homeowners. Such educational and training programs are the foundation for sound management decisions in pesticide use, including alternatives. Through PAT, instruction in IPM use is made available to over 500,000 pesticide applicators each year. This program will most significantly contribute to Goal 4, "Greater Harmony between Agriculture and the Environment."

(8) An increase of $1,191,000 for Sustainable Agriculture Research and Education to focus on organic farming ($3,309,000 available in fiscal year 2000):

Sustainable agriculture is economically viable, environmentally compatible, socially acceptable, and culturally appropriate. A component of sustainable agriculture is organic farming. Producers, consumers, the media, land-grant universities, and the USDA are

showing increasing interest in organic farming and marketing, a small but rapidly growing segment of U.S. agriculture. An initiative on organic research, extension and outreach will bring support and visibility to the partnership's efforts, provide leadership within the USDA, and will serve an expanding and increasingly active constituency of producers and consumers. The SARE program can administer the initiative effectively, and more efficiently than would be the case if a separate new program were set up.

The development of an organic rule by USDA's Agricultural Marketing Service has legitimized and attracted substantial attention to organic agriculture, including over 275,000 public comments on the draft rule. The organic marketplace has grown at an estimated 20 percent per year in recent years, and is increasingly attractive to producers looking for profitable alternatives to low commodity prices. The existing SARE program has significant experience with organic farming and marketing issues under the larger umbrella of sustainable agriculture, and an innovative structure (regional organization with strong stakeholder involvement; integration of research with extension and outreach; multi-institutional collaboration; and a commitment to on-farm research) that is well-suited to involvement of organic stakeholders and to addressing organic farming and marketing research and extension in a holistic manner. Funding this program would bring recognition and support to the growing investment by land-grant partners, but would likely involve significant administrative costs as a separate program.

An increase of $1,191,000 for SARE under Smith-Lever 3(d) will be used to support the development of knowledge and expertise in organic farming and marketing among Extension and other agricultural professionals through SARE's Professional Development Program (PDP). The majority of the funds will be available for the development of educational resources and opportunities (e.g. workshops, farm visits) awarded competitively through the existing regional PDP grant programs to address efforts to link extension and other agricultural professionals to farmers who are doing on-farm research and help them improve their collaboration.

Organic farming represents a small but rapidly-growing method of achieving profitable, competitive production (CSREES Goal 1) which also generally improves harmony with the environment (Goal 4). Specific outputs and outcomes would be developed collaboratively with organic farmers and other stakeholders as an integral part of implementation of this program, but would certainly include an increase in production and marketing options for organic farmers, which would in turn result in an increase in profits for both current and new organic farmers, and to an increase in the number of organic farmers and processors and in the amount and variety of organic product available to consumers.

(9) A decrease of $2,628,000 to eliminate funding for Rural Health and Safety ($2,628,000 available in fiscal year 2000):

This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer reviewed grants. Alternate

funding from formula programs, State and local governments, and private sources could be used to support aspects of this program deemed to be of high priority at State and/or local levels.

(10) An increase of $440,000 for Extension Services at the 1994 Institutions to help them meet the nonformal education needs of the communities they serve ($3,060,000 available in fiscal year 2000):

This increase is proposed in response to the USDA Civil Rights Action Team Report recommendation that the agencies determine if the land-grant institutions are receiving equitable support to assist USDA in carrying out its mission. The thirty 1994 Institutions are facing enormous challenges in bringing needed educational programs to the people served in their primarily Native American communities. No State funds and few local funds are available to the 1994 Institutions to help them meet the nonformal education needs of the communities they serve. Many of these institutions are small, but their communities face serious problems related to health, limited educational opportunities, decisions in agricultural enterprise management and community development, lack of programming for youth, environmental management, nutrition, and related areas that can be addressed under the broad mandate of the Cooperative Extension System. Additional resources are needed to continue to plan and build an appropriate extension capacity at these institutions to meet the needs of their communities. Programs in agriculture, forestry, nutrition, health, economic development, and youth development are critical to the survival of Native American communities.

Funding from this program provides an important base from which a basic staffing infrastructure can be maintained. It enables the 1994 Institutions to hire, train, and develop core staff who will initiate and continue extension programs that are accessible throughout the primarily Native American communities they serve. Additional resources will build on the base started with fiscal year 1997 through 2000 funding to allow for the assessment and continuation of existing programs and the implementation of new programs. Awards are made to the 1994 Institutions through and in cooperation with 1862 or 1890 Institutions. The 1862 Institutions are providing technical support in the proposal development process as well as in the implementation of funded projects.

This program contributes primarily to the CSREES Strategic Goal 5, "Enhanced Economic Opportunities and Quality of Life among Families and Communities."

(11) A net decrease of $6,160,570 for Federal Administration ($12,093,570 available in fiscal year 2000):

(a) An increase of $268,000 for Ag In The Classroom to help ensure that future generations are agriculturally literate ($208,000 available in fiscal year 2000):

The mission of Ag In The Classroom (AITC) is to help ensure that future generations are agriculturally literate. The Program encourages educators to

integrate information about the food and agriculture system across curricula to assist students in understanding the pivotal role of agriculture in the U.S. and the world economy. Students are also exposed to environmental and cultural issues impacting agriculture. The long range goal of the program is a citizenry that makes informed decisions on policies impacting the food and agriculture system. Funds appropriated for this program are used to leverage agricultural literacy activities in all 50 states, the District of Columbia, and U.S. territories by providing national leadership and guidance to the primary education community.

Today's youth are further removed from this country's agriculture heritage than ever before. Many young people have little or no concept of the origins of their food and fiber, how they are produced and processed, and how these products reach their communities and homes. This results in a misunderstanding of the importance of agriculture, environmental impacts, production, processing, marketing, distribution, financing, and other issues. The need to address this problem was recognized by USDA via the creation of the Ag In The Classroom Program. From the onset the program has served as a catalyst to develop a network of AITC efforts in all 50 states, the District of Columbia, and U.S. territories. These programs receive Federal guidance, but no direct funding. The program reaches over 120,000 teachers impacting over 5 million students.

AITC plays a unique role in carrying out the REE strategic plan by advancing agricultural literacy through a grass-roots network of state coordinators, teachers, agribusiness leaders, and other educators. Specific initiatives to be supported with increased funding include: expanded outreach to underrepresented populations; demonstration projects; integration of information technology to reduce program delivery costs; and outstanding teacher recognition initiatives.

In the Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127, April 4, 1996) Congress noted the importance of increasing the number of young Americans pursuing a baccalaureate or higher degree in the food and agricultural sciences (Sec. 805d). Agricultural literacy is a first step in creating interest in and awareness of career opportunities in the food and agricultural sciences. AITC helps fulfill the President's initiatives by helping to prepare a workforce able to apply science to enhance a safe, secure food and fiber system and a healthy, well-nourished population throughout a global economy. AITC fosters opportunities to implement civil rights initiatives. Reaching out with the message of agriculture literacy through this national program can encourage participation in agriculture from a variety of traditionally underrepresented groups.

AITC cuts across all five goals of the REE Strategic Plan by enhancing agriculture literacy. Early intervention of AITC begins the process of attracting future leaders' interest in scientific and technical careers in agriculture. This is a venue for American agriculture to improve its competitiveness in production, processing, and marketing, as described in Goal 1. AITC contributes to ensuring

food safety through science-based education as well as hands-on knowledge applied immediately in the home to achieve Goal 2. Ag In The Classroom contributes to Goal 3 by developing curricula and disseminating materials about more nutritious foods, enabling people to make health promoting choices. By utilizing AITC in support of environmental education, USDA enhances the quality of the environment through education about agriculture and forestry linkages with soil, water, air, and biotic resources, as described in Goal 4. AITC addresses economic and social challenges facing youth, families, and communities by engaging children in creative, positive interactions with the world around them, contributing to Goal 5.

(b) A decrease of $7,149,570 to eliminate earmarked projects ($7,149,570 available in fiscal year 2000) consisting of:

$	-197,000	Beef Producers' Improvement (AR)
	-106,263	Botanic Gardens Initiative (IL)
	-170,022	Conservation Technology Transfer (WI)
	-3,500,000	Delta Teachers Academy
	-550,000	Diabetes Detection, Prevention (WA)
	-100,000	Extension Specialist (MS)
	-246,000	Income Enhancement Demonstration (OH)
	-250,000	Cow/Calf Management (IA)
	-195,000	National Center for Agricultural Safety (IA)
	-163,000	Pilot Technology Transfer (WI)
	-326,000	Pilot Technology Transfer (OK & MS)
	-197,000	Range Improvement (NM)
	-276,285	Rural Development (AK)
	-280,000	Rural Development (NM)
	-150,000	Rural Development (OK)
	-246,000	Rural Rehabilitation (GA)
	-197,000	Wood Biomass/Alt. Farm Product (NY)
	-$7,149,570	TOTAL

This change will eliminate funding for these projects for which prior funding has supported initial development. This action is consistent with the Administration's belief that the most effective use of taxpayer dollars is through competitively-awarded, peer reviewed grants that meet National goals.

(c) An increase of $670,000 and 4 staff years for Enhancement of Small Farms Capability in USDA (no funding available in fiscal year 2000):

In January 1998, the National Commission on Small Farms submitted to the Secretary its report *A Time to Act*. The Commission's report itemized eight policy goals for a National strategy for small farms and 146 recommendations to help implement those goals. A Small Farms Action Team was formed to guide USDA

review and implementation of the Commission's recommendations. Interagency teams were formed to address each policy goal and action plans were developed for the recommendations. Policy goal 2 of the Commission's report focused on a recommendation to create a framework of support and responsibility for small farms.

The USDA Council on Small Farms guides overall policy decisions affecting small farms and assures consideration of effects of all program decisions on small farms viability. The Council is chaired by the Deputy Secretary and is composed of Under and Assistant Secretaries with responsibilities for small farms programs. A small farms coordinator has been named for each mission area and agency. These coordinators form a working group to coordinate activities, analyze program effects, develop new strategies, and report on Department progress. An external Advisory Committee on Small Farms has been established to receive public comments and to provide advice to the Department on small farm and related issues.

This budget initiative will provide the minimal level of resources needed to establish the small farms coordination function on a permanent basis. The Director of Small Farms, the Assistant Director of Small Farms and staff will work with the cross-section of USDA agencies, through the Council on Small Farms and the small farm coordinators, to ensure consideration and implementation of the recommendations of the Commission and full integration of these ideas, concepts, and analyses into overall USDA program delivery. Specific responsibilities would include:

- Ensure efficiency of programs through coordination and cooperation of USDA small farm programs;
- provide a point of contact for constituents, such as small farmers, community-based organizations, Congress, State and local governments, educational institutions, and other Federal Departments;
- review and monitor mission area and agency mission statements, strategic plans, programs, policies, rules, and actions for inclusion of service to small farms;
- provide staff support to the external Advisory Committee on Small Farms;
- serve as Executive Director of the USDA Council on Small Farms and provide staff support to the Council;

- chair working groups of agency personnel to develop, help implement, and monitor interagency work on specific issues, such as contracts, local and regional food systems, outreach, communications and education, and training of USDA employees;

- coordinate interagency efforts to host USDA-wide small farm conferences;

- serve on White House, Inter-departmental and interagency task forces and working groups that have a bearing on small farms issues, such as the Concentration Response Team;

- represent the Secretary and the Department on small farms issues both internally and externally;

- develop and market within USDA new programs and actions that USDA can take to better serve small farms; and

- initiate, write and coordinate interagency progress reports as well as other required or requested reports.

This initiative is related to CSREES Strategic Goal 5 to enhance economic opportunities and the quality of life among families and communities.

(d) An increase of $51,000 to restore general administration funds ($4,736,000 available in fiscal year 2000):

In fiscal year 2000, the Administration and the Congress negotiated a reduction which equated to 0.38 percent reduction of total discretionary funding. A portion of the USDA reduction was taken by reducing administrative funding such as travel, supplies, training, and other administrative expenses. The CSREES share of this reduction was $51,000 which was rescinded from the Extension Activities general administration funding item. This increase restores the critical funding level required to support administration of the extension programs.

TABLE 1A - FISCAL YEAR 1999

DISTRIBUTION OF FEDERAL PAYMENTS FOR EXTENSION AT COOPERATIVE EXTENSION SERVICES

STATE	SMITH-LEVER FORMULA/A	PEST MGMT	FOOD SAFETY COMMUNITY	FARM SAFETY	1890 LAND GRANT & TUSK UNIV/EAI	INDIAN RESERVATION PROGRAMS	CENTER	PEST IMPACT ASSESS.	WATER QUALITY	YOUTH AT RISK	1890 FACILITIES	RENEWABLE RESOURCES	RURAL DEVELOP CENTERS	SUSTAINABLE AGRICULTURE	RURAL HEALTH AND SAFETY	FEDERAL ADM SPECIAL PROJECTS	INDIAN TRIBAL COLLEGE	TOTAL FEDERAL FUNDS
ALABAMA	6,724,785	268,941	290,000	10,200	2,656,974	0	1,911,640	35,399	120,000	150,000	693,936	89,751	0	0	0	0	0	12,152,716
ALASKA	1,061,680	87,800	90,000	10,200	0	62,800	107,466	14,452	162,978	229,441	0	40,193	0	0	0	0	0	1,915,140
AMER SAMOA	793,160	36,000	30,000	10,200	0	0	58,988	14,200	60,000	0	0	0	0	0	0	0	0	1,007,528
ARIZONA	2,116,116	112,000	129,586	10,200	0	361,420	541,420	38,561	200,100	275,000	0	42,985	0	0	0	0	65,000	3,946,470
ARKANSAS	5,729,838	403,800	109,463	10,200	1,199,932	0	1,216,240	41,648	247,900	205,433	430,936	72,948	0	0	0	284,150	0	9,960,547
CALIFORNIA	4,982,889	278,109	411,291	10,200	0	0	3,199,109	404,567	263,666	150,000	0	94,964	0	0	0	0	0	11,752,805
COLORADO	2,936,864	112,000	83,966	111,700	0	0	536,704	34,250	223,438	150,576	0	49,641	0	0	0	0	0	4,239,139
CONNECTICUT	1,861,109	80,000	169,602	10,200	0	0	437,660	11,810	+328,500	150,000	0	42,112	0	0	0	0	0	3,213,993
DELAWARE	1,167,720	80,000	60,000	111,700	433,652	0	214,352	17,212	148,000	150,000	337,478	42,112	0	0	0	0	0	2,752,127
DC	898,648	0	80,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,088,648
FLORIDA	4,832,004	187,700	252,000	10,200	1,117,451	58,592	1,884,489	209,388	140,000	343,000	454,030	86,001	0	0	0	10,000	0	9,457,606
GEORGIA	7,841,304	357,810	668,011	10,200	1,800,731	0	2,080,681	48,494	169,322	307,350	602,730	121,138	0	0	0	3,598,150	0	17,137,805
GUAM	838,050	36,000	0	10,200	0	0	59,119	14,200	60,000	0	0	0	0	0	0	0	0	1,021,569
HAWAII	1,201,450	80,000	36,000	10,200	0	0	249,497	30,899	80,000	150,000	0	42,112	0	0	0	72,000	0	1,922,158
IDAHO	2,327,656	132,569	30,000	10,200	0	64,400	352,483	34,510	178,969	200,000	0	51,355	0	0	0	0	0	3,719,122
ILLINOIS	5,110,416	278,100	89,390	111,700	0	0	2,056,715	87,495	30,000	0	0	94,873	0	0	0	0	0	11,858,641
INDIANA	5,280,857	288,219	130,000	368,500	0	0	1,163,108	49,113	239,000	150,000	0	84,466	0	0	0	0	0	10,719,263
IOWA	5,052,402	284,300	70,000	111,700	0	0	879,324	93,744	273,730	150,000	0	42,112	176,338	0	0	475,200	0	11,686,900
KANSAS	3,861,444	190,200	102,911	10,200	0	0	668,634	60,710	81,630	407,835	0	42,112	0	0	0	0	64,500	7,384,181
KENTUCKY	9,054,896	112,000	165,000	111,700	2,004,220	0	1,605,889	43,816	150,703	405,729	0	93,594	0	0	0	0	0	13,751,715
LOUISIANA	5,251,448	296,800	120,000	10,200	1,101,689	0	1,807,048	30,967	90,000	150,000	420,291	75,801	0	0	420,480	0	0	9,750,690
MAINE	2,060,468	532,261	30,000	98,200	0	0	407,287	18,021	181,785	150,000	0	51,849	0	0	0	0	0	3,430,389
MARYLAND	4,837,384	112,000	30,000	10,200	847,013	0	1,113,508	21,988	180,000	150,000	393,076	42,112	0	9,950	0	0	0	9,904,000
MASS	3,463,380	112,000	30,000	10,200	0	0	926,388	19,068	140,000	150,000	0	42,112	0	0	0	384,000	0	4,293,128
MICHIGAN	6,487,815	180,200	259,840	10,200	0	0	1,720,595	291,593	220,115	0	0	74,058	0	9,500	0	0	65,000	11,454,560
MICRONESIA	889,167	36,000	64,350	10,200	0	0	68,160	14,200	60,000	0	0	0	0	0	0	0	0	1,146,097
MINNESOTA	5,220,660	284,136	161,830	111,700	0	0	918,618	64,865	200,000	448,625	0	53,130	0	0	0	0	229,900	11,832,753
MISSISSIPPI	6,788,878	250,902	118,200	111,700	1,311,143	67,000	1,632,327	39,791	140,000	229,000	0	81,034	176,338	0	2,102,400	252,480	0	13,390,211
MISSOURI	5,123,513	264,409	142,316	111,700	2,002,088	0	1,490,472	82,285	190,000	48,000	560,108	65,337	0	5,000	0	0	0	13,048,900
MONTANA	2,430,756	181,331	40,000	10,200	0	282,700	288,870	21,231	208,849	150,000	0	58,382	0	0	0	0	551,025	4,299,823
NEBRASKA	4,637,384	348,700	257,106	111,700	0	0	930,570	65,191	199,206	150,000	0	42,112	0	748,518	0	0	0	7,398,515
NEVADA	1,151,385	87,900	30,000	10,200	0	64,166	168,118	15,725	138,000	150,000	0	42,112	0	0	0	0	0	1,840,606
N. HAMPSHIRE	1,941,502	80,000	30,000	10,200	0	0	330,130	19,486	288,147	150,000	0	42,112	0	0	0	0	0	2,371,937
NEW JERSEY	2,844,740	112,000	30,000	10,200	0	0	1,027,947	21,274	80,000	150,000	0	42,112	0	0	0	0	0	4,108,374
NEW MEXICO	2,107,792	80,000	324,130	10,200	0	130,400	490,701	33,040	155,000	0	0	47,801	0	0	0	457,920	194,000	3,927,074
NEW YORK	8,920,520	242,075	581,378	10,200	0	0	3,278,082	36,174	177,963	41,400	0	84,365	0	0	0	189,120	0	13,470,147
N. CAROLINA	11,499,496	269,331	203,011	109,575	2,384,782	49,900	2,439,995	85,616	195,893	298,200	676,736	91,497	0	723,388	0	0	0	19,031,341
N DAKOTA	3,382,120	112,000	30,000	111,700	0	64,000	322,291	38,879	80,000	149,000	0	42,112	174,338	0	0	0	321,050	4,776,555
N MARIANAS	789,259	36,000	30,000	10,200	0	0	59,068	14,200	60,000	0	0	0	0	0	0	0	0	980,725
OHIO	8,708,464	268,200	325,810	10,200	0	0	2,118,887	66,488	278,985	150,000	0	56,617	0	0	0	0	236,150	13,097,569
OKLAHOMA	5,230,310	265,900	30,000	10,200	1,196,896	37,600	1,014,918	40,972	280,142	0	444,071	42,112	0	0	0	0	200,480	8,908,403
OREGON	3,790,105	248,100	213,586	10,200	0	64,200	478,241	32,427	120,000	150,000	0	53,000	0	0	0	0	0	5,213,168
PENNA	9,440,874	224,884	30,000	111,700	0	0	2,600,875	204,685	51,050	150,000	0	99,034	176,338	0	0	0	0	13,207,139
PUERTO RICO	6,419,946	61,300	30,000	10,200	0	0	1,352,330	21,732	80,000	79,289	0	0	0	0	0	0	0	8,636,799
RHODE ISLAND	953,157	67,900	30,000	10,200	0	0	392,718	14,700	118,000	150,000	0	42,112	0	0	0	0	0	1,783,562
S. CAROLINA	5,678,839	234,985	60,000	10,200	1,182,178	0	1,472,779	26,651	220,000	212,000	438,385	84,220	0	0	0	0	0	9,508,319
S DAKOTA	3,278,621	112,000	40,000	111,700	0	130,900	378,815	32,764	215,000	150,000	0	42,112	0	0	0	0	152,525	4,691,127
TENNESSEE	8,048,569	218,078	142,943	111,700	1,803,135	0	1,610,104	42,049	100,000	150,000	510,021	83,969	0	0	0	0	0	14,103,693
TEXAS	12,338,651	752,373	113,618	111,700	3,466,029	0	4,053,648	67,452	148,698	340,876	647,378	83,240	0	0	0	0	0	31,084,370
UTAH	1,883,810	80,000	30,000	111,700	0	0	267,324	19,627	170,000	189,244	0	42,112	176,338	748,389	0	48,755	0	3,595,298
VERMONT	1,898,890	67,900	30,000	10,200	0	0	227,044	18,776	80,000	150,000	0	42,112	0	925,874	0	0	0	3,334,557
V. ISLANDS	814,867	36,000	0	10,200	0	0	58,316	0	70,000	80,000	0	0	0	0	0	0	0	1,049,381
VIRGINIA	7,158,140	196,100	130,000	10,200	1,521,099	0	1,831,501	34,171	244,988	150,000	481,317	93,727	0	0	0	0	0	11,818,790
WASHINGTON	4,085,288	148,100	29,992	10,200	0	130,900	654,625	62,901	211,721	150,000	0	79,289	0	0	0	72,000	65,000	5,903,026
W. VIRGINIA	3,858,324	92,900	40,000	10,200	0	0	943,801	18,803	60,000	108,155	0	60,106	0	0	0	0	0	5,233,748
WISCONSIN	5,269,036	202,300	290,000	111,525	0	0	822,691	68,645	381,305	150,000	0	87,091	0	0	0	156,480	230,000	10,827,243
WYOMING	1,424,911	80,000	30,000	10,200	0	74,000	182,200	18,836	80,000	150,000	0	42,112	0	0	0	0	0	2,076,209
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEER PANEL/CSAA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REIMBURSABLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	269,228,580	10,381,680	7,070,400	2,680,000	24,909,180	1,646,440	58,947,580	3,085,440	6,178,560	6,640,000	7,092,682	2,084,320	871,850	3,178,840	2,922,880	5,934,915	1,977,600	430,573,181
UNFUNDED BAL	0	0	0	0	0	0	0	0	0	0	2,300,120	0	0	0	0	0	0	2,300,120
SUBTOTAL	269,228,580	10,381,680	7,070,400	2,680,000	24,909,180	1,646,440	58,947,580	3,085,440	6,178,560	6,640,000	9,392,802	2,084,320	871,850	3,178,840	2,922,880	5,934,915	1,977,600	432,873,301
FEDERAL ADMIN	7,369,420	431,320	294,600	120,000	1,033,720	68,560	147,120	128,560	382,440	360,000	296,400	127,680	36,320	132,360	105,120	5,206,085	82,400	16,752,104
UNFUNDED BAL	50,001	0	0	0	0	0	0	0	0	0	524,578	0	0	0	0	0	0	574,580
SUBTOTAL	7,319,420	431,320	294,600	120,000	1,033,720	68,560	147,120	128,560	382,440	360,000	750,978	127,680	36,320	132,360	105,120	5,206,085	82,400	16,739,684
TOTAL	276,648,000	10,783,000	7,365,000	2,800,000	25,943,000	1,715,000	59,095,000	3,214,000	6,561,000	7,000,000	10,143,980	2,192,000	908,000	3,309,000	2,628,000	11,141,000	2,060,000	449,704,965

TABLE 2A - FISCAL YEAR 2000

DISTRIBUTION OF FEDERAL PAYMENTS FOR EXTENSION AT COOPERATIVE EXTENSION SERVICE

STATE	SMITH-LEVER (FORMULA)	PEST MGMT	FARM SAFETY	1890 LAND GRANT UNIV (EA)	1890 EXTENSION & TUSK RESERVATION PROGRAM	EFNEP	YOUTH AT RISK	TECH FACILITIES	RENEWABLE RESOURCES	RURAL DEVELOP CENTERS	SUSTAINABLE AGRICULTURE	RURAL HEALTH AND SAFETY	FEDERAL ASSN SPECIAL PROJECTS	1994 LAND GRANT COLLEGE	TOTAL FEDERAL FUNDS
ALABAMA	8 724 285	0	0	2 658 974	0	1 911 140	0	0	0	0	0	0	0	0	13 293 399
ALASKA	1 697 550	0	0	0	0	167 468	0	0	0	0	0	0	265 234	0	1 494 350
AMER SAMOA	792 160	0	0	0	0	58 968	0	0	0	0	0	0	0	0	851 128
ARIZONA	2 118 118	0	0	0	0	541 420	0	0	0	0	0	0	0	0	2 657 536
ARKANSAS	5 726 838	0	0	1 109 832	0	1 210 240	0	0	0	0	0	0	168 120	0	8 334 030
CALIFORNIA	6 993 869	0	0	0	0	3 180 100	0	0	0	0	0	0	0	0	10 174 068
COLORADO	2 535 854	0	0	0	0	538 704	0	0	0	0	0	0	0	0	3 473 556
CONNECTICUT	1 951 109	0	0	0	0	437 860	0	0	0	0	0	0	0	0	2 388 969
DELAWARE	1 187 770	0	0	433 852	0	214 252	0	0	0	0	0	0	0	0	1 835 874
DC	966 688	0	0	0	0	0	0	0	0	0	0	0	0	0	966 688
FLORIDA	4 632 001	0	0	1 117 451	0	1 964 485	0	0	0	0	0	0	0	0	7 713 937
GEORGIA	7 641 304	0	0	1 600 191	0	2 080 661	0	0	0	0	0	0	0	3 596 160	15 118 296
GUAM	839 050	0	0	0	0	50 719	0	0	0	0	0	0	0	0	889 769
HAWAII	1 201 450	0	0	0	0	249 497	0	0	0	0	0	0	0	0	1 450 947
IDAHO	2 727 506	0	0	0	0	282 463	0	0	0	0	0	0	0	0	3 009 969
ILLINOIS	9 119 425	0	0	0	0	2 056 718	0	0	0	0	0	0	102 012	0	11 278 155
INDIANA	8 240 837	0	0	0	0	1 162 686	0	0	0	0	0	0	0	0	9 452 966
IOWA	9 092 460	0	0	0	0	873 324	0	0	0	0	0	0	427 200	0	10 392 984
KANSAS	5 561 444	0	0	0	0	669 934	0	0	0	0	0	0	0	0	6 231 378
KENTUCKY	9 054 896	0	0	2 804 220	0	1 605 999	0	0	0	0	0	0	0	0	13 465 215
LOUISIANA	5 251 446	0	0	1 101 869	0	1 807 040	0	0	0	0	0	0	0	0	8 160 355
MAINE	2 050 486	0	0	0	0	407 287	0	0	0	0	0	0	0	0	2 457 773
MARYLAND	3 227 164	0	0	847 015	0	613 506	0	0	0	0	0	0	0	0	4 687 705
MASS	2 483 350	0	0	0	0	836 388	0	0	0	0	0	0	0	0	3 320 748
MICHIGAN	8 487 955	0	0	0	0	1 720 599	0	0	0	0	0	0	0	0	10 208 554
MICRONESIA	699 147	0	0	0	0	66 380	0	0	0	0	0	0	0	0	765 527
MINNESOTA	9 239 960	0	0	0	0	950 418	0	0	0	0	0	0	0	0	10 190 378
MISSISSIPPI	6 768 628	0	0	1 311 143	0	1 653 337	0	0	0	0	0	0	352 480	0	9 985 588
MISSOURI	8 122 553	0	0	2 902 090	0	1 499 472	0	0	0	0	0	0	0	0	12 524 124
MONTANA	2 430 750	0	0	0	0	286 628	0	0	0	0	0	0	0	0	2 717 378
NEBRASKA	4 837 344	0	0	0	0	520 570	0	0	0	0	0	0	0	0	5 357 914
NEVADA	1 151 365	0	0	0	0	155 116	0	0	0	0	0	0	0	0	1 316 503
N HAMPSHIRE	1 541 662	0	0	0	0	230 150	0	0	0	0	0	0	0	0	1 771 782
NEW JERSEY	2 644 749	0	0	0	0	1 032 047	0	0	0	0	0	0	0	0	3 676 797
NEW MEXICO	2 107 752	0	0	0	0	460 701	0	0	0	0	0	0	457 920	0	3 026 413
NEW YORK	8 870 920	0	0	0	0	3 278 092	0	0	0	0	0	0	189 120	0	12 338 732
N CAROLINA	11 464 496	0	0	2 384 762	0	2 435 589	0	0	0	0	0	0	0	0	16 322 153
N DAKOTA	3 263 120	0	0	0	0	332 991	0	0	0	0	0	0	0	0	3 610 111
N MARIANAS	769 250	0	0	0	0	55 075	0	0	0	0	0	0	0	0	824 325
OHIO	9 706 464	0	0	0	0	2 110 457	0	0	0	0	0	0	224 180	0	12 041 401
OKLAHOMA	5 279 310	0	0	1 106 996	0	1 064 610	0	0	0	0	0	0	380 480	0	7 831 496
OREGON	3 780 105	0	0	0	0	475 241	0	0	0	0	0	0	0	0	4 255 340
PENN	9 440 874	0	0	0	0	2 600 575	0	0	0	0	0	0	0	0	12 041 449
PUERTO RICO	6 415 946	0	0	0	0	1 359 330	0	0	0	0	0	0	0	0	7 760 276
RHODE ISLAND	952 157	0	0	0	0	292 316	0	0	0	0	0	0	0	0	1 244 573
S CAROLINA	5 578 639	0	0	1 162 878	0	1 473 275	0	0	0	0	0	0	0	0	8 214 892
S DAKOTA	3 278 429	0	0	0	0	375 815	0	0	0	0	0	0	0	0	3 654 236
TENNESSEE	9 046 539	0	0	1 803 935	0	1 918 104	0	0	0	0	0	0	0	0	12 758 826
TEXAS	12 376 051	0	0	2 486 029	0	4 051 548	0	0	0	0	0	0	0	0	18 837 228
UTAH	1 483 910	0	0	0	0	297 324	0	0	0	0	0	0	0	0	1 981,134
VERMONT	1 808 050	0	0	0	0	227 044	0	0	0	0	0	0	0	0	1 935 164
V ISLANDS	514 967	0	0	0	0	58 314	0	0	0	0	0	0	0	0	573 181
VIRGINIA	7 158 140	0	0	1 521 966	0	1 631 501	0	0	0	0	0	0	0	0	10 311 637
WASHINGTON	4 695 280	0	0	0	0	654 625	0	0	0	0	0	0	528 000	0	5 297 913
W VIRGINIA	3 868 304	0	0	906 000	0	943 501	0	0	0	0	0	0	0	0	5 771 805
WISCONSIN	8 268 078	0	0	0	0	823 631	0	0	0	0	0	0	319 701	0	9 512 410
WYOMING	1 424 812	0	0	0	0	182 283	0	0	0	0	0	0	0	0	1 607,073
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEER PANEL/CSAA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REIMBURSABLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
					0			0							
SUBTOTAL	269 228 580	0	0	25,769 260	0	58 547 880	0	0	0	0	0	0	6 683 587	0	360 409 327
UNDISTRIBUTED	0	10,351,660	3,264,413	0	1,845,440	0	6,840,000	13,620,100	3,064,320	871,680	3,178,640	2,523,860	0	2,937,600	90,296,753
SUBTOTAL	269 228 580	10 351 660	3 264 413	25,769 260	1,845 440	58 547 880	6 840 000	13 620 100	3 064 320	871 680	3 178 640	2 523 860	6 683 587	2 937 600	450 706 080
FEDERAL ADMIN	7 319 420	431 320	138 017	1 073 720	68 560	147 120	360 000	460 000	127 680	36 320	132 360	105 120	5 229 983	122 400	15 770 020
UNDISTRIBUTED	0	0	0	0	0	0	0	524,579	0	0	0	0	0	0	524,579
SUBTOTAL	7 319 420	431 320	138 017	1 073 720	68 560	147 120	360 000	1 004 579	127 680	36 320	132 360	105 120	5 229 983	122 400	16 294 599
TOTAL	276 548 000	10 783 000	3 402 430	26 842 000	1 714 000	58 695 000	6 000 000	14 624 679	3 192 000	908 000	3 309 000	2 628 000	12 913 570	3 060 000	426 818 679

TABLE 3A - FISCAL YEAR 2001

DISTRIBUTION OF FEDERAL PAYMENTS FOR EXTENSION AT COOPERATIVE EXTENSION SERVICE

STATE	SMITH LEVER FORMULA	PEST MGMT	Youth Farm Safety Educ 2nd Cent	1890 UNIV & TUSK UNIV 1&A	INDIAN RESERVATION PROGRAM	EFNEP	YOUTH AT RISK	1994 ASIAN TRAINING	1890 FACILITIES	RENEWABLE RESOURCES	RURAL DEVELOP CENTERS	SUSTAINABLE AGRICULTURE	FEDERAL AGR SPECIAL PROJECTS	INDIAN TRIBAL COLLEGE	TOTAL FEDERAL FUNDS
ALABAMA	9,724,766	0	0	2,666,974	0	1,985,239	0	0	0	0	0	0	0	0	11,376,907
ALASKA	1,041,640	0	0	0	0	173,813	0	0	0	0	0	0	0	0	853,386
AMER SAMOA	782,160	0	0	0	0	81,218	0	0	0	0	0	0	0	0	2,678,381
ARIZONA	2,716,116	0	0	0	0	563,266	0	0	0	0	0	0	0	0	6,184,612
ARKANSAS	5,726,934	0	0	1,169,932	0	1,305,142	0	0	0	0	0	0	0	0	10,290,931
CALIFORNIA	8,693,929	0	0	0	0	2,302,847	0	0	0	0	0	0	0	0	2,494,221
COLORADO	2,036,984	0	0	0	0	367,367	0	0	0	0	0	0	0	0	2,405,827
CONNECTICUT	1,961,199	0	0	0	0	452,715	0	0	0	0	0	0	0	0	1,813,873
DELAWARE	1,167,729	0	0	435,692	0	232,551	0	0	0	0	0	0	0	0	956,666
DC	887,988	0	0	0	0	0	0	0	0	0	0	0	0	0	7,789,988
FLORIDA	6,033,901	0	0	1,117,491	0	3,048,317	0	0	0	0	0	0	0	0	11,802,201
GEORGIA	7,941,304	0	0	1,800,191	0	3,160,709	0	0	0	0	0	0	0	0	807,445
GUAM	815,840	0	0	0	0	87,398	0	0	0	0	0	0	0	0	1,480,353
HAWAII	1,376,489	0	0	0	0	269,183	0	0	0	0	0	0	0	0	3,020,488
IDAHO	2,737,900	0	0	0	0	283,349	0	0	0	0	0	0	0	0	11,248,326
ILLINOIS	9,118,425	0	0	0	0	2,136,901	0	0	0	0	0	0	0	0	6,497,707
INDIANA	6,286,807	0	0	0	0	1,208,886	0	0	0	0	0	0	0	0	9,696,407
IOWA	5,092,468	0	0	0	0	604,967	0	0	0	0	0	0	0	0	8,257,170
KANSAS	5,667,444	0	0	0	0	606,726	0	0	0	0	0	0	0	0	12,727,048
KENTUCKY	9,064,998	0	0	2,804,229	0	1,987,610	0	0	0	0	0	0	0	0	8,229,932
LOUISIANA	8,291,445	0	0	1,101,885	0	1,978,837	0	0	0	0	0	0	0	0	2,443,453
MAINE	2,062,453	0	0	0	0	422,867	0	0	0	0	0	0	0	0	4,069,023
MARYLAND	3,377,184	0	0	847,013	0	844,827	0	0	0	0	0	0	0	0	3,435,799
MASS	3,483,960	0	0	0	0	972,619	0	0	0	0	0	0	0	0	10,374,787
MICHIGAN	8,497,986	0	0	0	0	2,784,943	0	0	0	0	0	0	0	0	937,654
MICRONESIA	698,167	0	0	0	0	98,707	0	0	0	0	0	0	0	0	10,250,331
MINNESOTA	8,235,686	0	0	0	0	906,771	0	0	0	0	0	0	0	0	9,767,081
MISSISSIPPI	6,766,328	0	0	1,311,193	0	1,716,560	0	0	0	0	0	0	0	0	11,681,953
MISSOURI	8,122,661	0	0	2,002,099	0	1,857,291	0	0	0	0	0	0	0	0	2,725,660
MONTANA	3,436,788	0	0	0	0	297,836	0	0	0	0	0	0	0	0	5,377,958
NEBRASKA	4,027,344	0	0	0	0	640,312	0	0	0	0	0	0	0	0	1,332,660
NEVADA	1,161,365	0	0	0	0	171,476	0	0	0	0	0	0	0	0	1,780,852
N HAMPSHIRE	1,941,883	0	0	0	0	338,950	0	0	0	0	0	0	0	0	3,718,531
NEW JERSEY	3,644,268	0	0	0	0	1,011,781	0	0	0	0	0	0	0	0	3,617,385
NEW MEXICO	3,197,792	0	0	0	0	609,593	0	0	0	0	0	0	0	0	12,225,856
NEW YORK	8,620,829	0	0	0	0	3,408,338	0	0	0	0	0	0	0	0	10,417,050
N CAROLINA	11,469,484	0	0	2,384,762	0	2,933,762	0	0	0	0	0	0	0	0	3,828,031
N DAKOTA	3,263,128	0	0	0	0	348,911	0	0	0	0	0	0	0	0	428,445
N MARIANAS	788,389	0	0	0	0	97,166	0	0	0	0	0	0	0	0	11,906,830
OHIO	9,704,464	0	0	0	0	2,198,966	0	0	0	0	0	0	0	0	7,469,998
OKLAHOMA	6,316,818	0	0	1,156,686	0	1,063,982	0	0	0	0	0	0	0	0	4,283,643
OREGON	3,780,106	0	0	0	0	498,858	0	0	0	0	0	0	0	0	12,141,571
PENNA	9,640,974	0	0	0	0	2,700,697	0	0	0	0	0	0	0	0	7,620,340
PUERTO RICO	6,416,648	0	0	0	0	1,404,394	0	0	0	0	0	0	0	0	1,256,143
RHODE ISLAND	883,187	0	0	0	0	203,626	0	0	0	0	0	0	0	0	9,271,632
S CAROLINA	6,878,899	0	0	1,183,178	0	1,618,618	0	0	0	0	0	0	0	0	3,068,705
S DAKOTA	3,218,421	0	0	0	0	230,394	0	0	0	0	0	0	0	0	12,633,187
TENNESSEE	8,048,689	0	0	1,802,838	0	1,993,643	0	0	0	0	0	0	0	0	18,812,212
TEXAS	12,318,551	0	0	3,468,029	0	4,207,832	0	0	0	0	0	0	0	0	1,992,561
UTAH	1,693,610	0	0	0	0	306,771	0	0	0	0	0	0	0	0	3,834,435
VERMONT	1,588,662	0	0	0	0	336,765	0	0	0	0	0	0	0	0	879,426
V. ISLANDS	816,647	0	0	0	0	80,569	0	0	0	0	0	0	0	0	10,374,449
VIRGINIA	7,182,140	0	0	1,621,988	0	1,584,319	0	0	0	0	0	0	0	0	4,765,111
WASHINGTON	4,656,268	0	0	0	0	879,633	0	0	0	0	0	0	0	0	5,909,210
W VIRGINIA	3,165,394	0	0	859,008	0	979,826	0	0	0	0	0	0	0	0	2,225,270
WISCONSIN	8,168,070	0	0	0	0	869,192	0	0	0	0	0	0	0	0	1,814,089
WYOMING	1,424,812	0	0	0	0	169,277	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEER PANEL/CSAA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REOBLIGABLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0		0		0								
SUBTOTAL	289,378,688	0	0	28,769,380	0	60,981,060	0	0	0	0	0	0	0	0	355,709,820
UNDISTRIBUTED	0	11,278,340	6,800,000	0	4,800,000	0	9,800,000	1,440,000	11,620,000	3,064,338	671,660	4,322,000	0	3,360,000	50,334,240
SUBTOTAL	289,378,688	11,278,340	6,800,000	28,769,380	4,800,000	60,981,060	9,800,000	1,440,000	11,620,000	3,064,338	671,660	4,322,000	0	3,360,000	411,554,060
FEDERAL ADMIN	7,319,420	480,760	200,000	1,073,730	200,000	261,040	400,000	60,000	480,000	127,680	28,320	180,000	5,933,000	140,000	16,881,940
UNDISTRIBUTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	7,319,420	480,760	200,000	1,073,730	200,000	261,040	400,000	60,000	480,000	127,680	28,320	180,000	5,933,000	140,000	16,881,940
TOTAL	296,698,000	12,359,000	7,000,000	29,843,000	5,000,000	61,242,000	10,000,000	1,500,000	12,000,000	3,192,000	700,000	4,500,000	5,933,000	3,500,000	428,436,000

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Integrated Activities:

[For the integrated research, education, and extension competitive grants programs, including necessary administrative expenses, $39,541,000, as follows: payments for the water quality program, $13,000,000 payments for the food safety program, $15,000,000; payments for the national agriculture pesticide impact assessment program, $4,541,000; payments for the Food Quality Protection Act risk mitigation program for major food crop systems, $4,000,000; payments for the crops affected by Food Quality Protection Act implementation, $1,000,000; payments for the methyl bromide transition program, $2,000,000, as authorized under section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7626).] For the integrated research, education, and extension competitive grants programs, including necessary administrative expenses, $76,194,000, as follows: (1) for payments as authorized under section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7626), for the small farms initiative, $4,000,000; for the water quality program, $16,204,000; for the food safety program, $15,000,000; for the national agriculture pesticide impact assessment program, $4,640,000; for the Food Quality Protection Act risk mitigation program for major food crop systems, $10,000,000; for the crops affected by FQPA implementation, $3,000,000; for the methyl bromide transition program, $5,000,000; for the invasive species program, $1,500,000; for the biobased products program, $9,600,000; for the organic transition program, $1,000,000; (2) payments for the

international research, extension, and teaching activities for grants under section 1459A of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3291), as amended, to remain available until expended, $1,000,000; and (3) payments for anti-hunger and food security grants program under the same terms and conditions as those found in subsections (c), (d), (f), and (g) of section 25 of the Food Stamp Act of 1977, $5,250,000.

The first change deletes previous language.

The second change provides new language for the programs proposed in the FY 2001 budget, including the following programs: an invasive species program, a biobased products program, and an organic transition program, all as authorized by section 406 of the Agricultural, Research, Extension, and Education Reform Act of 1998. It also provides new language for the international science and education grants program as authorized by section 1459A of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended, and for the anti-hunger and food security grants program under the same terms and conditions as those found in subsections (c), (d), (f), and (g) of section 25 of the Food Stamp Act of 1977.

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

Lead-Off Tabular Statement

Integrated Activities

Apropriation Act, 2000	$39,541,000
Budget Estimate, 2001	76,194,000
Increase in Appropriation	$36,653,000

Summary of Increases

Item of Change	2000 Estimated	Pay Cost	Program Changes	2001 Estimated
Integrated Activities:				
Small Farms Initiative	- -	- -	$+4,000,000	$4,000,000
Water Quality	$13,000,000	- -	+3,204,000	16,204,000
Food Safety	15,000,000	- -	- -	15,000,000
Pesticide Impact Assessment	4,541,000	- -	+99,000	4,640,000
International Science & Education Grants	- -	- -	+1,000,000	1,000,000
Biobased Products Program	- -	- -	+9,600,000	9,600,000
Invasive Species	- -	- -	+1,500,000	1,500,000
Crops at Risk from FQPA Implementation	1,000,000	- -	+2,000,000	3,000,000
FQPA Risk Mitigation Program for Major Food Crop Systems	4,000,000	- -	+6,000,000	10,000,000
Methyl Bromide Transition Program	2,000,000	- -	+3,000,000	5,000,000
Organic Transition Program	- -	- -	+1,000,000	1,000,000
Anti-Hunger and Food Security Program	- -	- -	+5,250,000	5,250,000
Total Available, Integrated Activities	39,541,000	- -	+36,653,000	76,194,000

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

INTEGRATED ACTIVITIES

PROJECT STATEMENT

(On basis of appropriation)

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Year	Increase or Decrease		2001 Estimated Amount	2001 Estimated Staff Years
Integrated Activities:								
1. Small Farms Initiative	--		--		$+4,000,000	(1)	$4,000,000	
2. Water Quality..a/	$13,022,000		13,000,000		+3,204,000	(2)	16,204,000	
3. Food Safety..a/	12,365,000		15,000,000		--		15,000,000	
4. Pesticide Impact Assessment a/..	4,541,000		4,541,000		+99,000	(3)	4,640,000	
5. International Science and Education Grants	--		--		+1,000,000	(4)	1,000,000	
6. Biobased Products Program	--		--		+9,600,000	(5)	9,600,000	
7. Invasive Species	--		--		+1,500,000	(6)	1,500,000	
8. Crops at Risk from FQPA Implementation	--		1,000,000		+2,000,000	(7)	3,000,000	
9. FQPA Risk Mitigation Program for Major Food Crop Systems	--		4,000,000		+6,000,000	(8)	10,000,000	
10. Methyl Bromide Transition Program	--		2,000,000		+3,000,000	(9)	5,000,000	
11. Organic Transition Program	--		--		+1,000,000	(10)	1,000,000	
12. Anti-Hunger and Food Security	--		--		+5,250,000	(11)	5,250,000	
Federal Admin. (4%)	[1,197,120]		[1,581,640]		[+1,466,120]		[3,047,760]	
Total Integrated Activities obligations estimate	29,928,000	--	39,541,000	8	+36,653,000		76,194,000	10
Unobligated Balance:								
Available, start of year	--		--		--		--	
Available, end of year	--		--		--		--	
Total, Appropriation	29,928,000	--	39,541,000	8	+36,653,000		76,194,000	10

a/ Section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 authorizes an integrated research, education, and extension competitive grants program. Water Quality, Food Safety, and Pesticide Impact Assessment Special Research Grants and Smith Lever 3(d) programs previously shown on the research and education and/or extension activities project statement are now reflected above.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SYSTEM

FY 2001 EXPLANATORY NOTES
JUSTIFICATION OF INCREASES AND DECREASES

Integrated Research, Education, and Extension Activities

(1) An increase of $4,000,000 for the Small Farms Initiative to develop and deliver programs that will stop the erosion of the Nation's small farms (no funding available in fiscal year 2000):

The economic viability of small farms has decreased steadily for the past 30 years. In 1964, there were 3.2 million farms in the United States. Of those, about 3 million, or 94 percent, were farms with gross annual sales of less than $50,000. By 1992, the total number of farms had declined to 1.9 million, but farms with gross annual sales of less than $50,000 had declined even more rapidly and accounted for only 74 percent of the remaining farms (Agricultural Census). As the percentage of the food dollar that goes to the producer has declined — from 37 cents per dollar in 1980 to only 23 cents per dollar in 1997, for example — smaller operators have simply not been able to make ends meet from the low volume of product that they sell (National Commission on Small Farms).

There are many reasons why CSREES and its land-grant university partners need to develop and deliver programs that will stop the erosion of the nation's small farms.

- Small farms often lead the way in new product development. For example, the fastest growing sectors of the agricultural market in the United States today are the organic and natural food markets. Small farms led the way in both areas and contribute most of the production.

- Small farms enhance the quality of life for all Americans and protect natural resources for the entire nation. About one-third of the nation's 946 million acres of farm land belongs to small farmers. Small farms play a dynamic and important role in maintaining and stabilizing rural communities. Small farmers are often major clients of the business community in rural areas. Their tax dollars are critical to the entire community.

- Small farms also enhance the quality of life for urban communities. Small farms are often the only productive land use that can serve as a buffer between high density population centers and rural areas. They contribute significantly to the quality of the urban diet by providing fresh, high-quality, diverse produce through direct markets to urban residents.

- Small farms protect resources that serve all Americans. They provide open space for wildlife habitat, water recharge and the human need for contact with nature.

The $4 million initiative included in the President's 2001 Budget grows out of and supports the CSREES/Land Grant National Plan for Small Farms. The initiative and the National Plan for Small Farms both pre-date the 1998 Report of the National Commission on Small Farms, "A Time to Act," but many of the needs and priority areas for research, education and extension in the Commission's report are identified in the National Plan and are priorities for funding under the initiative. These priority areas directly address the economic, social and environmental problems that drive the decline in small farms nationally.

This initiative supports six policy goals of the National Commission on Small Farms: (1) recognize the importance and cultivate the strength of small farms; (2) promote, develop, and enforce fair, competitive, and open markets for small farms; (3) conduct appropriate outreach through partnerships to serve small farm and ranch operators; (4) establish future generations of farmers; (5) emphasize sustainable agriculture as a profitable, ecological, and socially sound strategy for small farms; and (6) dedicate budget resources to strengthen the competitive position of small farms in American agriculture. The initiative also supports the three goals of the National Small Farm Program: (1) Enhance the economic viability of small farms; (2) improve the contribution of small farms to environmental quality; and (3) enrich the quality of life for small farm families. These goals, in turn, support three REE strategic goals: (Goal 1) An agricultural production system that is highly competitive in the global economy, (Goal 4) Greater harmony between agriculture and the environment, and (Goal 5) Enhanced economic opportunity and quality of life for Americans.

These funds will permit CSREES to reach these goals much more rapidly than would otherwise be possible through timely, effective implementation of the objectives for the National Small Farm Program. These objectives are to provide support to Land Grant institutions and other partners who work with small farmers to develop research, education and extension programs to promote more effective: (1) marketing, including development of value added products, direct marketing, cooperative marketing and other appropriate marketing strategies for small farms; (2) entrepreneurial and business skills, including materials and programs that will help small farmers deal with their social and environmental issues; (3) facilitating the development of networks between farmers and those who work with farmers, in both the public and private sector, that can help small farmers gain better access to information; and (4) to help beginning farmers establish viable farm operations.

(2) An increase of $3,204,000 for Water Quality to support state and regional problem identification and the mitigation of factors leading to the delivery of agricultural chemicals, sediments, and pathogens to surface and ground waters ($13,000,000 available in fiscal year 2000):

Water quality is an important national concern, and agricultural practices are increasingly being targeted as the primary sources (point and non-point) of water quality impairment resulting from nutrients (primarily nitrogen and phosphorous), pesticides, sediments, and pathogens in surface and ground waters and, subsequently, to our nation's coastal waters. While agricultural sources are increasingly identified as the sources that can be most easily reduced, minimum provision has been made to help America's agricultural producers and agriculturally-dependent communities achieve the kinds of reductions being proposed without substantial reductions in profitability. There are four major issues currently before the public and the Congress that threaten immediate strictures on the agricultural community: Hypoxia, Harmful Algal Blooms and Pfiesteria, EPA-proposed rules on effluent discharge regulations, and EPA-proposed rules on Total Maximum Daily Loads (TMDLs) for non-point source pollutants. This modest increase to the CSREES Water Quality Program will provide critical support for state and regional problem identification, and for the mitigation of factors leading to the delivery of agricultural chemicals, sediments, and pathogens to surface and ground waters.

Hypoxia — Sediment cores collected in the hypoxic zone of the Gulf show that algal production and deposition, as well as oxygen stress, were much lower earlier in the century and that significant increases occurred in the latter half of the century. Land use change (e.g., deforestation and artificial agricultural drainage) and dramatic increases in fertilizer nitrogen input into the Mississippi River drainage basin between the 1950's and 1980's have been proposed as leading drivers of hypoxia in the Gulf of Mexico. The most significant trend in nutrient loads has been in nitrate, which has almost tripled from 0.33 million metric tons per year during 1955-70 to 0.95 million metric tons per year during 1980-96. About 90 percent of the nitrate comes from non-point sources, with the remainder coming from point sources. Agriculture has been identified as being responsible for as much as 65 percent of the nitrogen driving hypoxia in the Gulf of Mexico. The principal sources of nitrate are river basins that drain agricultural land in southern Minnesota, Iowa, Illinois, Indiana and Ohio. An Integrated Assessment conducted by the National Science and Technology Council's Committee on Environment and Natural Resources (CENR) has suggested that reductions in total nitrogen flux of about 40 percent are necessary to return to loads comparable to those before the large increases in the 1950-70 period. Model simulations indicate that nutrient load reductions of 20-30 percent would result in a 15 to 50 percent increase in bottom water dissolved oxygen concentrations and a 5 to 15 percent decrease in surface chlorophyll concentrations. The two primary approaches that the CENR Integrated Assessment suggests to reduce, mitigate, and control hypoxia in the Gulf of Mexico are: (1) reducing inputs of nitrogen to streams and rivers in the Basin and (2) restoring and enhancing natural denitrification processes in the Basin. In the first category, the most effective actions include improved management practices to retain nitrogen on fields, reducing application of nitrogen fertilizer (particularly above recommended rates), implementing alternative cropping systems, decreasing feedlot runoff, and reducing point sources. In the second category, the most effective actions would be increasing the acreage of wetlands and riparian buffers within the Basin. Both of these approaches require substantial increases in research, education, and extension assistance, if we are to minimize negative impacts on the agricultural sector.

Harmful Algal Blooms and Pfiesteria — In other national coastal waters, agricultural activities have been linked to outbreaks of Harmful Algal Blooms (HABs) in general, and to Pfiesteria, in particular. Although nitrogen has also been suggested as a contributing factor in HABs, phosphorous runoff from agricultural operations (particularly animal production) has been cited as a critical driver of toxic Pfiesteria outbreaks. Related to this is the need for a new look at the management of animal manure application based on phosphorous demand (as opposed to nitrogen) or on alternate uses of animal manure.

Effluent Discharge Regulation — Animal production operations are also being targeted by the EPA for regulation on the basis that they are sources of unpleasant (and unhealthy) odors and of human pathogens in water supplies. The development of systems approaches to the reduction of these problems is critical to the survival of the animal production industry in many states.

Total Maximum Daily Loads (TMDLs) — The EPA has also proposed a rule for the establishment of TMDLs for non-point source pollutants. This regulation, if adopted, would have its most substantial impact on the agricultural sector. The basic premise that each watershed has a threshold capacity to assimilate chemical pollutants (nutrients, pesticides) and to absorb physical impacts (sediment load, temperature change, stream morphology) would provide a *de facto* standard for the regulation of all non-point source activities in a given watershed.

In keeping with USDA's position that programs to reduce the impacts from agricultural practices should voluntarily be implemented at the local and state levels, the research, education and extension components of the CSREES Water Quality Program were initiated to protect water from contamination by agricultural chemicals (including agricultural plant nutrients and pesticides) and have included efforts to reduce the overall impact that agricultural practices have in degrading the physical structure and biological support capacities of waterways. The program is structured to allow the stakeholder community to be the group responsible for the identification of critical regional problems and for the development of approaches to resolve those problems. This approach has historically resulted in CSREES' support of a broad array of projects and state programs designed to reduce nutrient loading to surface and ground water. CSREES' activities will focus on watersheds as the common activity and reporting unit for water quality activities. Activities will be designed to facilitate inter-state collaboration as well as meet the needs of federal water quality programs. The objectives of these watershed-based activities would be to identify the causes of water quality degradation; conduct research filling the gaps that are critical to the development of water improvement practices and programs; implement watershed-scale improvement programs; monitor the efficacy of the improvement programs implemented; assess the costs and benefits of water quality management; and conduct evaluations closing the loop and improving our understanding of the drivers of water quality degradation.

(3) An increase of $99,000 for Pesticide Impact Assessment to support informed regulatory decisions concerning pesticides that significantly benefit U.S. food production without causing unreasonable adverse effects on the environment ($4,541,000 available in fiscal year 2000):

This increase will provide additional funds crucial to the support of information needs of USDA. CSREES will work with the USDA Office of Pest Management Policy when developing proposals for the use of these funds. IPM, NAPIAP, PMAP, and IR-4 resources will be coordinated to address FQPA issues and the loss of pest management alternatives for minor crops. Areas of emphasis include review and analysis of EPA risk assessments, the development of risk mitigation measures, and the analysis of transition strategies.

The requested level of funding for this program will allow for further enhancement of base data on pesticide use, crop profiles, and pest management planning by commodity. Funding will also enhance interactions with the Environmental Protection Agency and commodity organizations, thus facilitating efforts involving FQPA issues.

This program contributes to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Greater Harmony between Agriculture and the Environment."

(4) An increase of $1,000,000 and 2 staff years for International Science and Education Grants for a campus-focused initiative to strengthen U.S. economic competitiveness and promote international market development for U.S. agriculture (no funding available in fiscal year 2000):

The U.S. economy, particularly its agricultural and natural resources sectors, is being challenged as never before to develop and use new technologies, to expand industrial uses of food and fiber materials, and to operate in globally competitive and environmentally responsible ways. Success in this arena will require that U.S. food and fiber scientists redouble their engagement internationally through mutually beneficial collaborations and exchanges. In addition, to maintain a competitive edge in the future, U.S. colleges and universities must globalize their programs and faculty. Recognizing these needs, Congress authorized the Secretary to make competitive grants that support collaboration between U.S. Federal and university scientists with counterparts at international agricultural research centers pursuant to Section 227(b) of the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA). Additional authorization was provided in Section 229 of AREERA to conduct a competitive grants program that

supports globalization of colleges and universities so as to strengthen U.S. economic competitiveness and to promote international market development for U.S. agriculture.

These funds will be used to launch a campus-focused initiative that supports Section 229 of AREERA, fostering innovative teaching, research, and extension activities. Projects ranging up to $200,000 and lasting up to 3 years will be supported. Over the last 3 years, USDA has worked very actively with a broad cross-section of U.S. agricultural colleges and universities to develop a consensus on an agenda for their future joint involvement in the international arena. In 1998, Congress, with strong support from the university and college community, adopted this agenda and included provisions for a new "Competitive Grants for International Agricultural Science and Education Programs" in the AREERA. As recently as January 1999, the community once again expressed its strong commitment to the program; the National Association of State Universities and Land-Grant Colleges organized a meeting with representatives from over 30 land-grant and non-land-grant campuses (including many members of the International Committee on Organization and Policy), foundations, USDA, and other Federal agencies. The purpose of the meeting was to collectively scope specific features of the proposed new initiative in anticipation of future funding. Also, Historically Black Colleges and Universities and Hispanic-Serving Institutions participated in developing this proposed program and are expected to be successful candidates for grants.

The two initiatives funded under this request will strengthen the capacity of U.S. agricultural scientists at universities, colleges and Federal laboratories to contribute to four of the USDA Research, Education and Economics Strategic Goals. By strengthening the international skills of students, scientists, extension specialists, through international collaborative research exchanges, partnerships and globally-informed curricula, the initiatives will contribute to the current and future competitiveness of U.S. agricultural systems (Goal 1). Through the initiatives' international research, teaching and outreach activities, awareness of worldwide best practices will be strengthened, thus contributing directly to the safety and security of U.S. food and fiber systems (Goal 2). Greater harmony between agriculture and the environment (Goal 4) will be strengthened as the initiatives support international collaborations to enhance global environmental stewardship of natural resources. The initiatives will also contribute to greater economic opportunity and improved quality of life for citizens and communities (Goal 5) because it will provide better information on international marketing and investment opportunities and promote trade and beneficial technology transfer through global economic development.

(5) An increase of $9,600,000 for the Biobased Products program to generate information and tools for farmers to grow, harvest and handle alternative crops and for manufacturers to convert raw materials to useful products for use by industry and/or consumers (no funding available in fiscal year 2000):

This proposal is the CSREES component of a broad Departmental initiative that responds to Executive Order 13134 entitled "Developing and Promoting Biobased Products and

Bioenergy" which was signed by the President in August 1999. USDA's Biobased Products Coordination Council was established by the Secretary to coordinate activities of agencies engaged in research and development of agricultural materials and products for nonfood, nonfeed uses. Agencies that are represented on the Council have prepared a budget initiative that includes agency-specific plans and budgets in response to the Presidential Biobased Products Initiative. The purpose of the Departmental initiative is to use the broad base of expertise across the agencies to increase economic opportunities for U.S. farmers by developing and expanding markets through research, development and commercialization of new, economically competitive and environmentally preferable products from biobased resources.

A need exists for new products and new uses to expand markets for farm and forest products, to improve farm income, and for post farm-gate processing and related business activity to increase jobs and income in rural America. There is also increasing concern by policymakers and the public regarding the long-term adverse environmental impacts from the continuing use of nonrenewable fossil resources. Additionally, the United States has a growing dependence on imported sources of energy and industrial feedstocks. Currently, projects within CSREES that are relevant to these problems are, for the most part, single issue projects and do not take into account barriers to commercialization that can occur at various points along the research and development continuum.

This program proposes a systems approach for product development that will be multidisciplinary, regional in scope, and will require integration of research, education and extension activities. The program should generate information and tools for farmers to grow, harvest and handle alternative crops, for manufacturers to convert raw materials to useful products for industry or consumers. Product categories include paints, protective coatings (industrial and health-related), functional fluids (solvents, lubricants, hydraulic fluids, oil dispersants) fuels, adhesives, fibers, and environmental remediation. Specific topics that will be addressed for developing these products are:

Alternative crops - alternative crops are defined as new or non-traditional crops from agriculture and forestry that are not widely cultivated. Activities under this topic include crop production, harvesting, handling, processing, product development, and demonstration of product use. These activities will generate sufficient data for scale-up to a commercial operation.

New Uses and Byproduct/Waste Utilization - new uses and byproduct or waste utilization is defined as value-added nonfood uses from traditional crops, forestry resources, ag residues or waste streams from ag processing facilities. Activities under this topic include post harvest processing, product development, and demonstration of product use. These activities will generate sufficient data for scale-up to a commercial operation.

Testing and evaluation - products developed or optimized under this program, and are of interest to the military, will be tested and evaluated by the Department of Defense or

General Services Administration engineering centers to meet specifications or standards. The National Institute for Standards and Technology will also be used as appropriate.

Thomas Jefferson Initiative for Crop Diversification - this initiative is authorized in Title IV, Section 405 of the Agricultural Research, Extension, and Education Reform Act of 1998, and will serve as a national coordination effort for activities described above, and will address relevant issues not covered in the scope of the above activities, such as crop insurance.

Information Delivery - the biobased products information center at the National Agricultural Library will be considered as a potential information source. In addition, liaison activities will be conducted between the Office of the Federal Environmental Executive and USDA's environmental executives to optimize USDA's participation in implementing Executive Order 13101.

CSREES strategic goals 1, 4 and 5 are directly addressed through the research and development of biobased products that expand the domestic industrial base, are inherently environmentally preferable, and offer new opportunities to small farms and rural areas through job creation, expanded markets and local processing activities. CSREES strategic goal 6 is also addressed by virtue of the partnerships with industry, agriculture, academia and public agencies, all of which are required for successful commercialization.

(6) An increase of $1,500,000 for the Invasive Species program to address the spread of noxious and invasive species that threaten the long term health of natural resource lands in rural and urban areas (no funding available in fiscal year 2000:

The invasion of noxious and exotic plant, animal, insect, disease, and other microbial pests is an issue of profound importance to the nation's land and water resources. No land or water regime is immune from invasive problems and the nation is both losing income and incurring expenses to curb the problems. Invasive species have reached the level of national concern because of the large number of local-regional problems, cumulative economic impacts, and long-term threats to ecosystem sustainability.

The USDA and other Federal agencies have identified the spread of noxious and invasive species as among the greatest threats to the long term health of natural resource lands in rural and urban areas. Annually, billions of dollars are lost because of current infestations, and invasive species are spreading at an ever increasing rate. Currently, CSREES has one competitive grants program that specifically addresses invasive weeds, and others that include invasive species as part of the program portfolio. However, the effort is piecemeal and woefully inadequate given the magnitude of the problem. These programs focus on discipline-specific research with little integration of research with extension and education as a comprehensive management strategy. This gap in the integration of research disciplines with outreach specialists, land managers, and policy makers could be

uniquely filled by the Land Grant University (LGU) system given mutually developed guidelines and adequate resources to stimulate and coordinate invasive species interests on both a national and an ecoregional scale.

In response to Executive Order 13112, CSREES is proposing a new competitive grant program that supports integrated research, extension, and education activities in collaboration with representative individuals, groups and agencies at a local level to address invasive species issues on an ecoregional basis. This new program targets invasive species issues through an ecosystem-centered, collaborative process that prioritizes investment needs, based on analysis of risk and potential economic return for research, education, and extension programs. The LGU system provides a unique network of local, state and regional capacities and programs through its universities, agricultural experiment stations and county extension agents. CSREES also has a special relationship with scientific societies that will add scientific credibility to invasive species programs and help forge cooperative relationships with the public, land managers, and policy makers.

The new program calls for a consortium of research scientists, land managers and policy makers to rank-order invasive species problems using science-based criteria to assess environmental and economic risks, and select priority activities for funding. Leadership for the initiative will be provided by regional program coordinators assigned to each ecoregion using the CSREES Regional Integrated Pest Management Program as a model. Coordinators are anticipated to be volunteer professionals recognized as regional leaders with interests and responsibilities in invasive species. A regional advisory committee will provide local guidance while a national committee of regional coordinators and selected Federal partners will provide a national framework for the program. Coordinators will have project support to maintain a communication network, develop requests for proposals, select and seat project review panels, support workshops, and other outreach activities as required to implement regional invasive species responsibilities.

The number of ecoregions will ultimately depend on the best complement between the number of regions that are characterized by distinguishable invasive species complexes and the coordination capacity available and/or needed for a particular area. Regional coordinators will facilitate collaborative research, academic preparation, and technology transfer as recommended by the national and regional advisory committees through a memorandum of understanding with effected universities. Likewise, Regional coordinators will facilitate collaborative research, academic preparation, and technology transfer through a memorandum of understanding with the effected universities. In addition, the coordinators would facilitate collaborative research, education, and technology transfer with other groups and stakeholders. This program will complement the invasive species research program of NRI, and will help set the NRI research agenda by developing local research priorities that can become part of a national research agenda. National coordination would be provided by a committee of ecoregional and CSREES representatives.

Improving the quality, sustainability, and productivity of our Nation's agriculture, forest, rangeland, and aquatic resources directly supports REE Strategic Goal 1: An agricultural system that is highly competitive in the global economy, and Goal 4: Greater harmony between agriculture and the environment. A comprehensive program aimed at controlling or abating the impact of exotic and invasive species must consist of three basic components: protection against new invasive species; control of recently introduced invasive species, and management of established invasive species.

(7) An increase of $2,000,000 for Crops at Risk from FQPA Implementation for projects that address the development of new multiple-tactic IPM strategies as FQPA is implemented ($1,000,000 available in fiscal year 2000):

Several crops and cropping systems face potentially severe economic impacts as result of the impending loss of certain pesticides through implementation of the Food Quality Protection Act of 1996 (FQPA). In the short term, these are mainly small acreage fruit and vegetable crops due to the current elimination or restriction on organophosphate and carbamate insecticides. However, in the relatively near future, many more crops, including the large-acreage grain, forage, and fiber crops, will be impacted as well when additional pesticide groups are addressed in the FQPA. The Crops at Risk program is an intermediate-term research and extension program with the at-risk crop or cropping system as the focal point. Development of new multiple-tactic IPM strategies designed to assist in the transition period for agriculture will be the goal of the program.

The commodity and pest management profiles being developed by State-level agencies under guidance from the USDA Office of Pest Management Policy (OPMP) will be used to prioritize a list of crops potentially at risk within each state. State priorities will then be assessed at the regional level to identify crosscutting challenges and opportunities for multi-state cooperation. The resulting assessments will serve as the basis for priority setting for a competitive grants program to be administered through CSREES in consultation with OPMP. Proposals will be selected using a two-tier review process that includes a relevance review by a panel of stakeholders and a subsequent technical merit review by a panel of scientists.

This program contributes most significantly to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Harmony between Agriculture and the Environment."

(8) An increase of $6,000,000 for FQPA Risk Mitigation Program for Major Food Crop Systems to help the nation's farmers respond to the challenges they will face as FQPA is implemented over the next decade ($4,000,000 available in fiscal year 2000):

Global markets for food and grain products demand high quality at competitive prices. Growers are faced with meeting these market demands in the face of ever-increasing production costs coupled with decreasing or unstable commodity prices. Added to these

constraints is the threat posed by the implementation of the Food Quality Protection Act (FQPA) over the next decade. Many of the pest management tools growers have depended on in the past may no longer be available in the future. The Environmental Protection Agency has already listed the organophosphate class of chemistry as a priority for use restrictions, and carbamates and B2 carcinogens are next priorities. Over half of the chemical pest management tools used by growers today are contained in one of these three groups of chemistry. FQPA implementation poses an immediate threat to pest management in fruits and vegetables and stored grains. Within the next few years, all crops will face similar threats. Growers face extreme uncertainty over which pest management tools will remain in their arsenal and how to combine those with new technologies such as bioengineered crop innovations and precision agriculture. There is a critical need to devise pest management systems which consider all aspects of crop production from the planted seed to the marketed product.

This new approach to risk mitigation will have a food and grain production system focus, integrating food safety and water quality considerations as impacted by FQPA. The program will involve the major acreage crops including corn, soybean, wheat, cotton and rice as well as the fruits and vegetables most important in the human diet, especially the diets of infants and children. Emphasis will be placed on development and implementation of new and innovative pest management systems designed to maintain crop productivity while meeting or exceeding environmental quality and human health standards. The outcome goal of this long-term effort is to eliminate or minimize pesticide residues in key foods and in ground and surface water used for human consumption.

In this program, research and implementation projects will be conducted as part of the Integrated Research, Education, and Extension Competitive Grants Program to help the nation's farmers respond to the challenges they will face as FQPA is implemented over the next decade. These will be long-term projects and will evolve from in-depth discussions of research needs and priorities involving all stakeholders. Projects will be multi-state or regional in scale and typically involve multiple cropping systems with emphasis on enhanced stability and sustainability of pest management systems. A major goal of this effort will be the development of biointensive pest management programs utilizing advanced understanding of cropping system biology and ecology. For example, the western corn belt could be the focus of a project designed to evaluate crop rotational options, pest prevention and avoidance techniques, pest monitoring strategies, and new pest population suppression tactics with the aim of developing a new approach to managing pests with reduced pesticide residues in crops, soil, and water while improving economics and sustainability for the grower.

This program contributes most significantly to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Harmony between Agriculture and the Environment."

(9) An increase of $3,000,000 for Methyl Bromide Transition Program to support the discovery and implementation of practical pest management alternatives for commodities affected by the methyl bromide phase-out ($2,000,000 available in fiscal year 2000):

The Agricultural Research Service currently conducts basic research on long-term methyl bromide replacement strategies. However, this new competitive program will focus on short- to intermediate-term solutions for all commodities at risk using either combinations of presently available technologies or some newly developed practices. Activities in this program will involve research designed to deliver and demonstrate the practicality and economic feasibility of new technologies. Technology transfer of research into practical management alternatives for methyl bromide will occur through cooperative extension activities. These efforts will be conducted at research facilities, extension centers, and grower demonstration plots.

This program contributes most significantly to CSREES Strategic Goal 1, "An Agricultural Production System that is Highly Competitive in the Global Economy," Goal 2, "A Safe and Secure Food and Fiber System," and Goal 4, "Harmony between Agriculture and the Environment."

(10) An increase of $1,000,000 for Organic Transition Program for the development and implementation of biologically based pest management practices that mitigate the ecological, agronomic and economic risks associated with a transition from conventional to organic agricultural production systems (No funding available in fiscal year 2000):

The organic marketplace has grown at an estimated 20 percent per year in recent years, and is increasingly attractive to producers looking for profitable alternatives to low commodity prices. A major impediment to many farmers considering the move from conventional to organic practices are concerns about practical and economical ways to maintain yields, particularly the availability of pest management tools that meet the needs of a certified organic production system. The development and adoption of biointensive or biologically based pest management tactics would address many of the certified organic production needs. Organic production requires a systems approach to pest management that is based on an understanding of pest ecology as part of a multi-trophic agroecosystem. Such an approach relies on the promotion of plant/crop health augmented by ecologically-sound biological control, natural plant resistance and pest behavior-modifying chemicals, cultural practices and habitat management that disrupts pest reproduction and augments beneficial organisms. The goals of organically-based pest management are to ensure safe, profitable, and durable pest management. This approach to pest management is designed to be integrated into whole farming systems that considers crop fertilization, cultivation, cropping patterns, and farm economics. The idea is to get away from the concept that pests can be controlled and focus instead on the potential for pest species to be managed. Organically- based pest management generally ranks favorably from the perspective of public health and environmental safety. Adoption of these technologies has been less common where effective and acceptable conventional pesticides exist. Implementation of the Food Quality Protection Act of

1996 (FQPA), is putting pressure on many conventional pest management practices which will change the availability and use of pesticides. A report to Congress by the Office of Technology Assessment ("Biologically Based Technologies for Pest Control," 1995) noted that the Federal government could exert a significant influence on the adoption of biologically based pest management technologies through its extensive and diverse roles in research, development, implementation, and regulation. This could include the certification standards required by organic producers.

The Organic Transition Program supports the development and implementation of biologically based pest management practices that mitigate the ecological, agronomic and economic risks associated with a transition from conventional to organic agricultural production systems. Funds would be distributed through a competitive process administered by the Cooperative State Research, Education, and Extension Service (CSREES) and implemented with input from the regional Sustainable Agriculture Research and Education (SARE) and Integrated Pest Management programs administered by CSREES. Proposals will be selected using a two-tier review process that includes a relevance review by a panel of stakeholders and a subsequent technical merit review by a panel of scientists. This program complements the SARE program and the proposed Risk Avoidance and Mitigation Program by addressing a gap that currently exists between the research and development needs of established organic production systems and the long-term needs when developing alternative cropping systems.

Organic food production represents over $3.5 billion in retail sales. Over the past six years, sales of organic products have shown an annual increase of at least 20 percent. Organic foods can be found at natural foods stores, health food sections and produce departments of supermarkets, and at farmers' markets, as well as through direct marketing such as Community Supported Agriculture. Many restaurant chefs across the country are using organic produce because they believe it to be of superior quality and taste. As the community of organic consumers and producers continues to increase, interest in organic production also has increased in the conventional farming community. Sound science supporting comparative risk analyses is needed to support this growing area. The Organic Farming Research Foundation is the only national organization that currently funds competitive research grants addressing organic production issues. This new program would substantially increase the resources available to address the most pressing pest management needs of organic farmers.

Organic farming represents a small but rapidly-growing method of achieving profitable, competitive production (CSREES Goal 1) which also generally improves harmony with the environment (CSREES Goal 4). Specific outputs and outcomes would be developed collaboratively with organic farmers and other stakeholders as an integral part of implementation of this program, but would certainly include an increase in production and marketing options for organic farmers, an increase in the number of organic farmers and processors, and growth in the amount and variety of organic products available to consumers.

(11) An increase of $5,250,000 for Anti-Hunger and Food Security Grants Program for projects that reduce hunger, improve nutrition, bolster community food security, and help families move from poverty to self-sufficiency (no funding available in fiscal year 2000):

Despite the strongest economy in decades, a recent USDA study indicates that 36 million Americans live in households suffering from hunger or are on the brink of hunger. More than three million American children live in households that directly experience hunger. In addition, according to a December 1999 report by the United States Conference of Mayors of 26 major cities in the United States, requests for emergency food from nonprofit charities increased by an average of 18 percent, with 85 percent of the cities registering such an increase. On average, 21 percent of the requests for emergency food from nonprofit charities went unmet because the charities ran out of food. Of those requesting food, 58 percent were in families with children, and 67 percent of the adults requesting food were employed.

Moreover, the problems of food insecurity and hunger affect more than individuals and families with isolated problems. The problems often revolve around difficulties faced by whole community food systems, including: small and medium-size family farmers having difficulty staying in business; community poverty and lack of effective job training and assets development efforts; and the lack of local food production and marketing.

Nonprofit groups, including faith-based organizations, have demonstrated their effectiveness in working in partnership with the Federal government, as well as state and local governments, to address these problems. Thus, these funds will be awarded to non-profit entities for projects that reduce hunger, improve nutrition, bolster community food security, and help families move from poverty to self-sufficiency.

Pursuant to subsections (c), (d), (f), and (g) of Section 25 of the Food Stamp Act of 1977, all funds will be used for grants for financial and technical assistance to community-based groups. Priority will be given to innovative public/private partnerships that comprehensively address local programs, as well as for the replication of successful model programs.

Specifically, the program will fund a wide variety of community-based activities that bolster local food systems, including projects that:

- Help small and medium-sized farmers sell food directly to local school districts and other large institutions;
- strengthen the infrastructure of nonprofit entities to increase the quantity and/or quality of the anti-hunger and food security services they provide;
- start or expand community gardens that enable low-income residents to produce their own food;

- increase the involvement of community volunteers in anti-hunger activities;
- help food insecure families move from welfare to work and from poverty to self-sufficiency;
- meet the unique needs of food insecure working families, senior citizens, and children;
- increase food recovery and gleaning activities to recover excess, wholesome food for distribution to the hungry;
- improve the ability of community groups to engage in effective hunger and nutrition-related research, monitoring, and evaluation; and
- support community kitchens and micro-enterprise projects that combine job training and small business development with addressing local food needs.

This program contributes to CSREES Goal 3, "A Healthy, Well-Nourished Population."

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

STATUS OF PROGRAM

CURRENT ACTIVITIES

Descriptions of current activities of the CSREES research, education, and extension programs are provided below.

RESEARCH AND EDUCATION ACTIVITIES:

Hatch Act. The Hatch research program at the State Agricultural Experiment Stations is designed to promote efficient production, marketing, distribution, and utilization of crops and livestock essential to the food supply, health, and welfare of the American people while conserving resources and improving rural living conditions. Students are provided valuable training opportunities to assist in scientific research projects conducted at the stations. Hatch Act formula funds are matched by non-Federal funds and are used to support research in Forest and Natural Resources; Crop Resources; Animal Resources; People, Communities, and Institutions; Competition, Trade, Adjustment, Price, and Income Policy; and Food Science and Human Nutrition. As a result of provisions contained in the Agricultural Research, Extension, and Education Reform Act of 1998, up to 25 percent of Hatch Act funds must be used by the State Agricultural Experiment Stations for integrated research and extension activities beginning October 1, 1999. Similarly, up to 25 percent of Smith-Lever Act formula funds, which primarily support extension activities, must be used for integrated research and extension activities beginning October 1, 1999. CSREES is engaged in jointly implementing the provisions of this new legislation with its land-grant university partners.

McIntire-Stennis Cooperative Forestry Research. The McIntire-Stennis Cooperative Forestry Research program supports research essential to the efficient and effective use of the Nation's forest resources. Timber production, forest land management, wood utilization, and the associated development of new products and distribution systems are the key elements of forestry research. Additional areas of investigation include wildlife, recreation, water, range, and environmental quality, which are essential to the long-term productivity and profitability of the integrated system of forest resources. The McIntire-Stennis program helps create and maintain a highly qualified cadre of forest scientists through students' direct involvement in research projects as a part of their graduate education. These young men and women, educated in the sciences fundamental to forestry, will ultimately help to sustain forest resources through service as managers and scientists in private industry, in various levels of government, and in academic institutions.

Evans-Allen Program at 1890 Colleges and Tuskegee University. The Evans-Allen formula-funded research program for the 1890 Colleges and Tuskegee University was established in the Food and Agriculture Act of 1977, as amended. Section 1445 of P.L. 95-113

authorized annual appropriations to support continuing agricultural research at the 1890 Colleges and Tuskegee University, and funds were appropriated under the Evans-Allen Program beginning in Fiscal Year 1979. In addition, this program supports development of agricultural expertise by providing training opportunities for students to assist in the research projects being conducted by scientists at these institutions. Appropriations under this authority are the primary source of support for the food and agricultural research programs at the 1890 Colleges and Tuskegee University. These programs place emphasis on small-scale agriculture, human nutrition, rural development and quality of living, crop resources, and animal resources.

Animal Health and Disease Research. The Animal Health and Disease Research (Section 1433, Public Law 95-113, as amended) formula program is dedicated to improving the health and productivity of animals; protecting human health through control of animal diseases transmissible to humans; minimizing livestock and poultry losses resulting from transportation and handling; and facilitating the effective treatment and prevention of animal diseases. Funds for this program have been appropriated to accredited schools or colleges of veterinary medicine and/or State Agricultural Experiment Stations that conduct animal health and disease research since FY 1979. State Comprehensive Plans for animal health research, approved by CSREES, are being followed by the eligible institutions within each State. These plans include the major areas of animal health research to be conducted by the institutions. Provisions of Section 1433 permit selection of studies within each State based on the highest-priority needs and the capabilities of the institutions to conduct the needed research.

Special Research Grants. The Special Research Grants Program concentrates on problems of national and local interest beyond the normal emphasis in the formula programs. The objectives of this program are to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation and to facilitate or expand ongoing State-Federal food and agricultural research programs. Generally, funding requested in Executive Branch budgets is for projects that have regional and/or national impact, such as those projects addressing global change, pest control issues, rural development, biological impact assessment, aquaculture centers, and sustainable agriculture.

Higher Education Programs. The USDA Food and Agricultural Sciences National Needs Graduate Fellowship Grants Program awards grants to colleges and universities to stimulate the development of food and agricultural scientific expertise in targeted national needs areas. This is the only Federal program targeted specifically to the recruitment and training of doctoral students for critical food and agricultural scientific positions. The competitive Institution Challenge Grants Program is designed to stimulate and enable colleges and universities to provide the quality of education necessary to produce graduates capable of strengthening the Nation's food and agricultural scientific and professional work force. Institutions match USDA funds on a dollar-for-dollar basis. The competitive Higher Education Multicultural Scholars Program provides grants to institutions for scholarships to attract and educate more students from groups currently underrepresented in the food and agricultural sciences for careers in agriscience and agribusiness. Institutions must provide 25 percent in matching funds. The competitive 1890

Institution Capacity Building Grants Program serves as the crux of the Departments's high-priority initiatives to advance the teaching and research capacity of the 1890 Land-Grant Institutions and Tuskegee University. The Tribal Colleges Endowment Fund, launched in 1996, distributes interest earned by an endowment established for the 1994 Land-Grant Institutions (30 Tribally controlled colleges) as authorized in the Equity in Education Land-Grant Status Act of 1994, P.L. 103-382, as amended. The Endowment Fund enhances education in agricultural sciences and related areas for Native Americans by building education capacity at these institutions in the areas of curricula design and materials development, faculty development and preparation for teaching, instruction delivery systems, experimental learning, equipment and instrumentation for teaching and student recruitment and retention. The Tribal Colleges Education Equity Grants Programs, also begun in FY 1996, is a formula program designed to enhance education opportunities for Native Americans by strengthening instructional programs in the food and agricultural sciences at the 30 tribally controlled colleges designated as the 1994 Land-Grant Institutions. The competitive Hispanic Education Partnership Grants Program, initiated in Fiscal Year 1997, as authorized by Section 1455 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3241), promotes and strengthens the ability of Hispanic-Serving Institutions to carry out higher education teaching programs in the food and agricultural sciences. Funded projects address one or more targeted need areas: curricula design and materials development; faculty preparation and enhancement for teaching; instruction delivery systems; scientific instrumentation for teaching; student experimental learning; student recruitment and retention; and library resources. The Ag in the Classroom Program, authorized in Section 1417 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended, was initiated in FY 1999. The program helps to advance agricultural literacy through a grassroots network of state coordinators, teachers, agribusiness leaders, and other educators by supporting initiatives that include expanding outreach to underrepresented populations; regional demonstration projects; integration of information technology to reduce program delivery costs; and outstanding teacher recognition initiatives.

National Research Initiative Competitive Grants Program. The National Research Initiative (NRI) Competitive Grants Program was established in 1991 in response to a recommendation from the National Academy of Science in a report entitled, "Investing in Research: A Proposal to Strengthen the Agricultural, Food and Environmental System." The report recommended a major increase in funding of high priority research in order to: (1) increase competitiveness of U.S. agriculture, (2) improve human health and well-being through studies on food safety and human nutrition, and (3) enhance the environment and natural resource base upon which agriculture depends. All U.S. scientists are eligible to compete on an equal basis for NRI funds, including scientists at land- grant universities, non land-grant universities, private universities and institutions, and Federal laboratories. The NRI uses merit review by scientific peers to identify the meritorious proposals for funding each year. At least 10 percent of the funds appropriated for the NRI are used for strengthening the U.S. agricultural research system. These funds go to new investigators, scientists at small and mid-sized institutions, or institutions at states that historically have not been competitive for research funds, and for seed grants and the

purchase of equipment. The NRI encourages multidisciplinary research needed to solve complex problems and seeks to open new areas of science and engineering with relevance to food, forestry, agriculture, and the environment.

Small Business Innovation Research (SBIR) Program. The Small Business Innovation Development Act was designed to strengthen the role of small, innovative firms in Federally funded research and development. Under the SBIR program, 2.5 percent of appropriations for research and development is set aside for awards to eligible small firms. The SBIR Program is a three-phased effort, but only Phase I and Phase II, the feasibility and follow-on research development phases respectively, are eligible for support with USDA funds. Firms are encouraged to secure Phase III, or the commercialization phase, funding from other public or private sources. The nine categories of research areas supported under the SBIR Program are: Forests and Related Resources; Plant Production and Protection; Animal Production and Protection; Air, Water, and Soils; Food Science and Nutrition; Rural and Community Development; Aquaculture; Industrial Applications; and Marketing and Trade.

EXTENSION ACTIVITIES:

Smith-Lever 3(b) and (c). Federal contributions for Cooperative Extension work are primarily derived from Section 3(b) & (c) formula funds appropriated under the Smith-Lever Act of 1914. These funds comprise 62 percent of the total Federal funding for extension activities and are mainly used to fund base programs. Federal funds are matched by non-Federal sources, primarily States and counties, and support base programs, the major educational efforts that are central to the mission of the Cooperative Extension System and common to most Extension units. The current base programs are: Nutrition, Diet, and Health; Natural Resources and Environmental Management; Community Resources and Economic Development; Family Development and Resource Management; 4-H and Youth Development; Leadership and Volunteer Development. These base programs can be thought of as the foundation of a building, with the National Initiatives rising from the base to receive special emphasis for a specific period of time. The current National Initiatives are: (1) Food Safety and Quality; (2) Workforce Preparation; (3) Healthy People . . . Healthy Communities; (4) Animal Waste Management; and (4) Child Care. As a result of provisions contained in the Agricultural Research, Extension, and Education Reform Act of 1998, up to 25 percent of Smith-Lever funds must be used by the State extension directors for integrated research and extension activities beginning October 1, 1999. Similarly, up to 25 percent of Hatch Act formula funds, which primarily support research activities, must be used for integrated research and extension activities beginning October 1, 1999. CSREES is engaged in jointly implementing the provisions of this new legislation with its land-grant university partners.

Smith-Lever 3(d). Other sources of Federal funding for extension activities include the Smith-Lever section 3(d) or targeted funds, which are provided to the States to address special programs or concerns of regional and national importance and are distributed through administrative or

non-statutory formulas and merit-reviewed projects. The following Extension programs are funded under the Smith-Lever 3(d) funding mechanism: Expanded Food and Nutrition Education Program (EFNEP); Pest Management; Farm Safety; Rural Development Centers; Children, Youth, and Families At Risk; Extension Indian Reservations Agents; and Sustainable Agriculture. EFNEP funds are distributed on the same population-based formula used for the Smith-Lever 3(b) and (c) distributions but are not required to be matched. Funds under other Smith-Lever 3(d) programs are distributed under administratively-based formulas and by competitive process. Generally, there are matching requirements for these funds.

Payments to the 1890 Land-Grant Institutions and Tuskegee University. Federal funding provides the primary support for the extension programs at the 1890 Land-Grant Institutions and Tuskegee University primarily addresses the needs of small-scale and minority agricultural producers and other limited-resource audiences. Section 1444 of the 1977 Farm Bill provides that the funds made available to the 1890's for extension programs be distributed on the basis of a formula identical to the Smith-Lever 3 (b) & (c) formula. These funds are used to maintain the extension infrastructure at the 1890's and the partnership with the Cooperative Extension System.

1890 Facilities Program. Federal funds provide the primary support for enhanced extension, research, and teaching facilities at all of the 1890 land-grant institutions. Some examples of the use of funds include the renovation of office space and laboratories; much needed computer and equipment purchases; the acquisition of satellite downlinking and distance learning capabilities; and the construction of joint research and extension multi-purpose/conference centers. The 1890 Facilities Program enables the 1890 land-grant institutions to improve their capacity and better address the needs of farmers, and rural populations with limited resources.

Renewable Resources Extension Act (RREA). The RREA program provides funding for expanded natural resource education programs. Funds are distributed by an administratively-derived formula to all States for educational programs and projects. The Cooperative Extension System provides research-based education about renewable natural resources. Extension education enables the management of renewable natural resources in a way that better serves individual owners, local communities, and the Nation.

INTEGRATED ACTIVITIES:

Programs included under the Integrated Activities account established in FY 2000 are Water Quality, Food Safety, Pesticide Impact Assessment, Crops at Risk from Food Quality Protection Act Implementation, Food Quality Protection Act Risk Mitigation Program for Major Food Crop Systems, and the Methyl Bromide Transition Program. Funding is provided on a competitive basis for integrated, multifunctional agricultural research, extension, and education activities.

SELECTED EXAMPLES OF RECENT PROGRESS

Provided below are selected examples of recent progress made under CSREES programs as related to the five CSREES Strategic Goals. Although many activities supported by CSREES contribute to multiple goals, these examples are arrayed under the Strategic Goal to which they make the most significant contribution.

Goal 1 - An Agricultural Production System that is Highly Competitive in the Global Economy

Goal Overview

Agricultural research and extension services have helped American farmers post tremendous productivity gains while reducing the expenses farmers pay for fertilizer, labor, and other business inputs. Today, more than ever before, farm profitability depends on doing the right thing, the right way, at the right time. The research, extension, and education programs supported by the USDA/land-grant university partnership will continue to chart the course by training scientists and other professionals in the food and agricultural sciences, by making scientific discoveries, and by adapting those discoveries to field-tested technologies.

Examples of Accomplishments that Contribute to Goal 1

Iowa State University animal scientists discovered that ketosis is usually preceded by a condition called fatty liver, which typically arises within the first month after calving when cows can't consume enough food to meet energy needs and their fat stores are tapped. Support from the **National Research Initiative** enabled researchers to discover that if they could prevent or cure fatty liver, they could stop most cases of ketosis. Treating cows with a natural hormone called glucagon corrects the fat imbalance in the liver and clears up fatty liver. A patent is being sought for the treatment. Solving the ketosis problem would save the estimated $150 million to $300 million a year it costs U.S. dairy producers each year. Fatty liver has also been linked to costly conditions such as mastitis, metritis, poor conception rates, decreased appetites and generally poor performance, potentially increasing the benefits even more.

Global positioning, geographic information systems and other new technologies are being used by farmers to increase the precision of agriculture chemical applications in crop fields. This allows farmers to reduce the volume of chemicals applied, providing both environmental and economic benefits. However, spray rate variability has been limited in practical machines by the fixed orifice size of conventional nozzles. More expensive multi-boom systems are required to provide the range of application rates called for in precision farming systems. **Hatch Act** funding has enabled researchers at the **University of Arkansas** to develop a simple variable orifice nozzle (patent pending) that allows a much wider application rate for a given pressure change than with conventional nozzles. Prototypes of this nozzle have been fabricated in the laboratory and tests are underway. Preliminary results indicate good potential for use on the

thousands of rate controlled aerial application platforms in this country. An economical and effective variable-orifice nozzle will help farmers implement precision agriculture systems. This technology can dramatically reduce the amount of chemicals required to control a weed or pest population in a target field, for example. The benefits include less chemicals in the environment, higher yields and a reduced expenditure for pesticides, fertilizers and other chemical products.

Bee colonies in the mid-Atlantic region have decreased due to bee mites (Varroa and tracheal mites) and a combination of environmental/mite-related conditions called parasitic mite syndrome. Heavy losses were especially evident in 1995-1996 and 1996-1997 winters, both in colony numbers and population of individual colonies. Losses have created concern as to whether there will be sufficient honey bee colonies of adequate size to meet regional fruit, berry, and vegetable commercial pollination needs. Wild colonies also provide pollination services for home gardeners and native plants. A regional task force, with support from Smith-Lever 3(b) and (c) formula funds, functions to help coordinate a research/extension program designed to investigate the detrimental effects of bee mites on bee colonies in an attempt to maintain adequate numbers and populations of honey bee colonies required to meet regional planned pollination of crops and natural pollination of homeowner gardens/plants and wild/native plants. Non-pesticide, or integrated pest management (IPM), alternatives for Varroa mite control are being tested as part of a regional evaluation of such an approach. **Delaware Cooperative Extension** is coordinating this effort, which also includes a newsletter, electronic communication, slide sets, video presentation, and written and oral communication through newsletters, Extension publications, short courses, and beekeeper/grower meetings. The IPM approach to mite control is now feasible with the regional information gathered on sampling methods and threshold determination of mite effects. Technology transfer through extension is under way but not yet evaluated for effectiveness. While heavy losses were repeated in 1997-1998, adequately prepared colonies have been available to meet planned pollination. Also, more foraging bees are appearing in backyard gardens and on native flowering plants.

Dairy producers and consumers are interested in reducing the incidence of mastitis in dairy cows and therefore the amount of antibiotics administered to the cows. **Animal Health and Disease** formula funding supported development of the J-5 vaccine by faculty at the School of Veterinary Medicine, **University of California, Davis,** to prevent coliform mastitis infections in dairy cattle. Researchers estimate that the use of the J-5 vaccine to prevent mastitis saves the California dairy industry an estimated $11 million a year, or about $52 per cow, or roughly 25 percent of a producer's profit margin. The preventive strategy also reduces use of antibiotics, protecting consumers from possible drug residues. Animal Health and Disease formula funding also enabled faculty at the university to discover that *Neospora caninum* is a major cause of spontaneous abortion of dairy calves. Researchers estimate that spontaneous abortion of dairy calves cost the California dairy industry up to $35 million in 1997 due to lost calves and reduced milk production. Researchers are now working to prevent *Neospora caninum*.

Catfish has become an economically viable crop for farmers in East Mississippi. One such catfish producer faced a serious problem because local, small processors could not take his fish, and larger plants were far away and could not guarantee they would process his fish. The catfish producer decided to solve his own problem. With detailed information and recommendations from the Mississippi State University Extension Service, which is supported by Smith-Lever 3(b) and (c) formula funding, the producer built a small facility that processed 30,000 pounds of catfish per day. Within six months, production surpassed the plant's processing capability, so he expanded. Within a year, the facility needed another $3.5 million expansion, which is currently underway. MSU Extension Service specialists provided input on plant and line expansions, equipment specifications, quality and cost controls, HACCP compliance and management advice throughout the process. Today the plant employs 100 people, and intends to hire another 60 when the current expansion is complete in 1999. The plant processed an average of 75,000 pounds of catfish daily in 1998, and should double that capacity in 1999. The annual processing capacity of about 38 million pounds supports 6,000 to 7,000 acres of catfish ponds, and the plant is under contract to process fish for larger processors across the state.

A research group at Oregon State University, with support from the National Research Initiative, is cloning the genes responsible for synthesis of medium-chain fatty acids, which have significant commercial value, from wild plants of the genus *Cuphea*. These genes, when introduced into *Arabidopsis*, increase the production of shorter-chain fatty acids. Such discoveries are likely to lead to an increased supply of more useful agricultural products.

The Department of Entomology at Virginia Polytechnic Institute and State University developed the course entitled, "Insects and Human Society" with the objective of extending knowledge of insects to everyone. The course reaches out to future journalists, lawyers, legislators, teachers, and others, so that they appreciate the impact insects have on human society. "Insects and Human Society" is presented in two formats: as a traditional on-campus lecture class for undergraduates and as an innovative distance education course. The on-campus lecture course uses a variety of electronic and analog media to present this information in a large-class setting with more than 400 students. Faculty make use of electronic presentations, Web-based class materials and tools, audio, video, live insects, and a dynamic presentation style to present material which will interest students and demonstrate the importance of this group. The distance education course is offered over the internet to an international group of students. It includes on-line materials at a course web site; electronic lectures complete with slides and audio clips; electronic quizzes and tests; electronic discussion forums; and student feedback. In the four years the on-campus lecture class has been offered, more than 2,100 students have been taught. Enrollment has grown from 10 in the fall of 1994 to a high of 531 in the fall of 1998. The distance education version of the class has grown from nine students enrolled in the first course in the fall of 1997 to 210 students enrolled in the fall of 1998. Support from the Institution Challenge Grants Program assisted in the development of this course.

Indiana muskmelon and watermelon farmers, who produced $19 million in melons in 1997, apply protective fungicides regularly to avoid serious losses associated with plant diseases. Usually, growers spray fungicides on a weekly basis during the two months when vines grow rapidly, and fruit develops and is harvested. Southwestern Indiana's 8000 acres of melons annually use approximately 40 tons of fungicide (chlorothalonil) worth approximately $960,000. Sprays are applied weekly to reduce or eliminate risk of disease-related loss, despite extended periods of hot, dry weather during which disease is of little or no threat. Researchers at **Purdue University** have invented a disease-warning system, MELCAST, to help farmers schedule fungicide sprays at the most appropriate times, thereby reducing the need for, and the expense of, fungicide sprays. The MELCAST warning system uses hourly weather data to index each day in terms of its favorability for disease development. The index indicates when environmental conditions are favorable for the development of disease and a fungicide spray is warranted. Instead of spraying every seven days, regardless of disease risk, melon growers helped by MELCAST can spray when a disease threat exists. During the 1995-1998 seasons, farmers testing and using the system reduced their fungicide use by up to 25 percent -- two or three sprays per season. The result is a 10-ton reduction in chemical use and nearly $250,000 saved in fungicide costs by Southwestern Indiana farmers in a single year. The researchers received support for this effort from the **Special Research Grants** programs for **National Agricultural Pesticide Impact Assessment** and **Integrated Pest Management**.

Beef producers have seen their profits limited by an oversupply of cattle on the market. Declining prices combined with the drought of 1998, forcing many farmers to sell off cattle because they had no feed. University of Georgia experts believe the secret to success is to market their product, not just sell it. In Coffee and Atkinson counties, the Extension Service agents launched an intensive educational program using Smith-Lever 3(b) and (c) formula funding to make producers aware of marketing alternatives. The counties' first producers are now marketing their steers and heifers through video marketing and taking part of the Farmer to Farmer Beef Challenge Program. As others follow suit, the potential benefits to the area's cattle producers is great.

Goal 2 - A Safe and Secure Food and Fiber System

Goal Overview

In the U.S each year, food-borne illnesses caused by *E. coli, salmonella, Campylobacter, Listeria*, and other bacteria, affect millions of people. The young, the elderly, and people with compromised immune systems are particularly vulnerable to food-borne illnesses. The research, extension, and education programs supported by the USDA/land-grant university partnership are providing holistic, "field-to-fork" approaches to reducing food-borne illnesses. In an effort to maintain the security of our food and fiber products, these programs also address the broad objectives of this goal by focusing on threats from exotic pests, climate change, and other factors.

Selected Examples of Recent Progress that Contribute to Goal 2

The contamination of beef and dairy products with the highly virulent *E. coli* 0157:H7 continues to compromise food safety and pose a major health problem worldwide. It is known that healthy cattle can harbor this pathogen transiently in their gastrointestinal tracts, but the conditions that allow *E. coli* 0157:H7 to colonize in the gut and build up in numbers sufficient to pose a threat to food safety are unknown. Research supported by the **National Research Initiative** at the **University of Idaho** has shown that an animal's diet influences the duration of infection as well as the quantity of the bacteria in the fecal material. This knowledge potentially can lead to on-farm guidelines that reduce the number of infected animals entering the human food chain. An unexpected and important finding of this study was that *E. coli* 0157:H7 can survive in fecal material in the environment for more than two years, thereby providing a reservoir of the pathogen for reinfection.

Texas annually produces more than 4 percent of all broilers and eggs in the U.S., and these two commodities are valued at more than $1 billion. Poultry products are also one of the leading sources of salmonella poisoning. The demand for safer products could negatively impact the poultry market and the Texas economy, if a solution is not implemented. Methods of minimizing salmonella infestations in flocks are available, but those programs require rapidly screened breeder, broiler and layer flocks, as well as rapidly screened flock environments. Support from **Hatch Act** formula funding has enabled **Texas A&M University** poultry science researchers to develop a method to sample the air in poultry houses and run rapid diagnostic tests for specific foodborne pathogens on these collected air samples so that entire poultry houses can be rapidly screened for the presence of salmonella and other foodborne pathogens. This protocol reduces lag time between sampling of poultry houses and actual confirmation of Salmonella contamination which, especially in poultry products, is a significant public health hazard. Thus, methods are urgently needed for the early detection and elimination before the final product reaches the consumer. The new protocol provides a way for the poultry industry to design a preventative strategy at the hatchery and breeder flock stage rather than a trace-back response to an already documented outbreak.

Many Iowans are concerned about the safety of their food. Few consumers today understand their role in maintaining the safety and quality of food once it has been purchased and/or brought into the home. Lack of knowledge and misinformation can lead to hazardous food handling practices and inappropriate food choices. Support from Smith-Lever 3(b) and (c) and Smith-Lever 3(d) funding has been used by Iowa State University extension professionals to develop a pilot tested food safety curriculum for high school students using animation and self-paced lessons via the World Wide Web. In cooperation with the Food Safety Network in Canada, a searchable archive of food safety articles from international wire services and scientific journals was established and made available on a website. Currently this is the only site in the world that maintains a searchable archive of these articles. Web-based food safety information is novel, entertaining, and effective for consumers of all ages. One hundred fifteen high school students who pilot tested the food safety curriculum, "Safe Food: It's Up to You," improved their scores

after accessing the website; pretest scores were 68 percent correct and, after completing four lessons, student scores were 80 percent correct. Also, more than 5,000 consumers accessed and completed Lesson 1 and their average score on the exam was 86 percent correct.

Veterinary practitioners and researchers often lack a background in regional livestock health problems. Regional production systems, environmental conditions, management practices and pathogens can play a significant role in livestock health concerns and the possibility of passing pathogens to humans. **North Dakota State University's** Veterinary and Microbiological Sciences Department received funds from the **National Needs Fellowship Grants Program.** Two doctoral students were recruited and have been working in the department since 1998. Their research is to discover molecular- and cellular-level behavior of diseases in livestock. Their basic projects aim at improving animal health and controlling disease and illness transferred between other animals and humans. One project is matching antibodies to a protein NDSU researchers think can be used to diagnose *E. coli* infections in livestock. Early diagnosis would reduce the cost of treatment and cut the risk of contaminating other animals or humans. The other major project involves isolating a toxin produced by a number of *E. coli* that cause calf scours, resulting in decreased productivity and death in cattle.

News reports of food poisoning linked to deli meats and hot dogs contaminated with strains of Listeria raised concerns that new, more resistant strains of bacteria may be emerging in ready-to-eat foods. Accidental exposure of meat products to toxic micro-organisms, such as Listeria, poses real safety hazards for consumers and severe economic consequences for producers. Researchers at the **University of Vermont** are discovering ways to make processed meats stay safer, longer. Using a whey protein-based edible coating, in conjunction with a number of naturally occurring anti-microbial agents, researchers were able to inhibit effectively the growth of Listeria on beef frankfurters. Separate testing of frankfurters not inoculated with Listeria indicated that the edible coating does not alter the sensory profile of consumers who could not see or taste the difference between coated and non-coated products. The use of whey-based edible coatings will help improve the safety and quality of processed meat products with benefits to both consumers and the industry. Consumers will be better protected from potential health hazards caused by tainted foods, and the meat processing industry will be less at risk from the economic consequences of product safety recalls and plant closures. **Hatch Act** formula funding supported these efforts.

Assuring food served in restaurants, schools and nursing homes is as safe as possible is the aim of a **University of Nebraska Cooperative Extension** program. Since 1994, funding from the **Smith-Lever 3(b) and (c) formula program** has helped Nebraska Cooperative Extension offer ServSafe training to more than 3,000 food service managers in the state, including 500 managers during fiscal 1997-98. ServSafe's success prompted Extension to develop and launch new training for cooks and wait staff in 1998. Statewide, 95 percent of ServSafe participants passed a national certification test following training. Managers report increasing their knowledge of safe food handling techniques that can reduce the risk of foodborne illness by an estimated 33 percent. Each ServSafe manager shared information with an estimated 15 fellow employees,

multiplying the training's impact. State inspectors report observing more food safety practices being used in food service establishments where managers have attended ServSafe.

Goal 3 - Healthy, Well-Nourished Population

Goal Overview

Getting the best nutrition from the foods we eat is a challenge. Most foods have nutritious ingredients, but some have more than others. Eating the right foods in the right amounts is vital for proper nutrition. The research, extension, and education programs supported by the USDA/land-grant university partnership are helping to provide healthy eating choices and helping to guide people to those choices.

Selected Examples of Recent Progress that Contribute to Goal 3

New Mexico is one of the poorest states in the nation with about 25 percent of the population living in poverty. Faced with limited resources, many New Mexicans develop problems associated with inadequate nutrition. Sometimes, children do not eat enough for optimum growth, development and school performance. More commonly, people make poor food choices, leading to chronic problems such as obesity, diabetes and heart disease. While some people get help from benefits like food stamps, recipients often lack knowledge about the relationships between health and basic nutrition, food safety, food preparation and resource management to make the most of them. **New Mexico State University's** Cooperative Extension Service teaches thousands of New Mexicans each year about how to make food choices that are more nutritious and economical through the **Extension Food and Nutrition Education Program (EFNEP)** supported under **Smith-Lever 3(d)**. In 28 New Mexico counties and on the Zuni reservation, EFNEP helps people who have limited resources, including families with small children, pregnant and parenting teens, young people, singles and senior citizens. Participants attend a series of hands-on classes where they learn how to select and make nutritious, tasty food that is quick to prepare and makes the most of their food dollars and food benefits. Within a year, EFNEP will graduate as many as 4,000 families annually. In addition, about 12,000 youth are reached with summer, in-school and after-school programs. After attending the classes, 93 percent of participants improve their nutritional practices, such as making sure their children eat breakfast. The number of participants who eat the recommended levels of fruit increases by 80 percent and vegetables by 50 percent. Also, 89 percent of participants improve their management of food resources, such as comparing prices or planning meals.

University of Illinois research has shown a broad variation in the composition and concentration of cancer-fighting components across different varieties of cruciferous vegetable. Even among a single vegetable type, broccoli, the researchers find a more than 10-fold variation in the content of glucosinolates, the precursors of cancer-fighting agents like sulforaphane. Variation in glucosinolate content with variety suggests genetic regulation of synthesis of the cancer-fighting components. A team of interdisciplinary researchers will use this information to produce high

glucosinolate hybrids of broccoli that have the ability to protect individuals from cancer. In that way, people can benefit without greatly altering their dietary habits. The broccoli-consuming public stands to gain significantly reduced cancer risk as a result of this research which is supported in part with **Hatch Act** formula funding.

Funding under the **Hispanic-Serving Institutions Education Grants Program** enabled **Bronx Community College** in **New York** to develop an associate degree in Food and Warehouse Management. Funding under the program also enabled **Northern New Mexico Community College** in **New Mexico** to develop an associate degree in Food Technology, and **Eugenio Maria De Hostos Community College** in **New York** has used funding to meet community nutrition needs through a new Dietetic Technician Program.

Over the past decade, **Pennsylvania State University** scientists have developed a biotechnological method for increasing young pigs' rates of overall growth and muscle growth and for reducing fat deposition in the animals. The researchers, supported in part by the **National Research Initiative**, have discovered that administration of somatotrophin increases pigs' growth rate by 10-15 percent, enhances muscle growth by as much as 50 percent, reduces fat deposition by 50-70 percent, and improves production efficiency by as much as 30 percent. The method also represents an advantage in reducing environmental pollution because more nutrients are used for growth and fewer are excreted into the environment. These research findings will help the swine industry produce leaner animals, improve the efficiency of swine production, and provide greater economic returns to swine producers. The development of a biotechnological approach to reducing fat also can benefit health-conscious consumers wishing to include more lean meat in their diets.

Low fat cheese has a bad reputation for taste but a good reputation for health, and consumers want a tastier low-fat cheese. **Ohio State University** research, supported with **Hatch Act** formula funds, shows that homogenizing cream before cheese-making allows the fat to become more evenly distributed through the cheese, making it softer. In regular low-fat cheese, special pictures taken through a process called laser confocal microscopy show that fat is spread through cheese like veins in pieces of Italian marble. In low-fat Swiss made with homogenized cream, the fat is sprinkled throughout in tiny specks, improving the texture significantly. The next step is to see if the process can be scaled up for use in commercial cheese making. Besides offering consumers a healthier and tastier product, these findings could benefit an important industry in Ohio; Ohio ranks first in Swiss cheese production, churning out 64 million pounds in 1997.

Cornell University was awarded a grant under the **Food and Agricultural Sciences National Needs Graduate Fellowship Grants Program** in the area of food engineering. A fellow was recruited and trained and is now Assistant Professor at Purdue University. A grant under this program to **Rutgers, the State University of New Jersey**, supported a fellow who conducted research leading to a dissertation on the heat and mass transfer of hygroscopic porous materials and is now Assistant Professor at Cornell University.

Nutrition education is a process that helps the public in applying knowledge from nutrition science and the relationship between diet and health to their food practices. It's a deliberate effort to improve the nutritional well-being of people by assessing the multiple factors that affect food choices, tailoring educational methodologies and messages to the public being reached, and evaluating results. It can help individuals develop a knowledge base, make a commitment to good nutrition, select nutritionally adequate diets, and develop decision-making skills. Reaching different stages of the life cycle with specially designed educational materials ensures a more positive outcome. Several programs conducted by **University of New Hampshire Extension**, with funding from the **Expanded Food and Nutrition Education Program** under **Smith-Lever 3(d)**, are designed for specific target audiences. Planning Ahead, Staying Ahead (PASA), a nutrition and money management series, is actually three different curriculum sets. The curriculum sets are designed for young families, Hispanic families, and seniors. Extremely popular, these curricula are targeted to different life cycle stages and interdisciplinary in nature. Using a variety of innovative teaching strategies, outreach methods, volunteers, agency collaboration, and grant dollars, many high-risk families were reached with nutrition information and education.

Goal 4 - Greater Harmony between Agriculture and the Environment

Goal Overview

Conserving our natural resources while allowing for economic growth and development can be a difficult balancing act, but it is not impossible. The research, extension, and education programs supported by the USDA/land-grant university partnership are showing that natural resource conservation and human endeavor need not be mutually exclusive.

Selected Examples of Recent Progress that Contribute to Goal 4

An estimated 50 million tons of manure is produced annually by Iowa's livestock and poultry industries. This represents millions of dollars in potential savings from fertilizer costs. The savings to the environment from better management could be equally substantial. However, data from the 1995 Iowa Farm and Rural Life Poll indicate that only 47 percent of Iowa producers who use livestock manure on their fields adjust their commercial fertilizer application rates. Only 9 percent use soil test results to calculate manure application rates. Support from **Smith-Lever 3(b) and (c)** formula funds have enabled **Iowa Cooperative Extension** to conduct more than 300 Managing Manure Nutrients workshops across Iowa for crop and livestock producers. Participants received color digitized soil maps for their fields along with instructions for implementing a manure management plan using soil tests. The information presented at the workshops was demonstrated at 20 field demonstrations statewide and were attended by 696 producers. Data collected from the plots (fall stalk nitrate samples, spring nitrate samples) are being reviewed and will be shared at upcoming workshops. Participants have been enthusiastic about the workshops, with 71 percent rating them excellent or superior. One third of the

participants estimated that their personal manure management plan would save them more than $20 per acre in reduced fertilizer costs, while 51 percent estimated savings from $6 to $20 per acre.

There have been many attempts to estimate the impact of major urban community tree planting programs on national efforts to mitigate carbon emission. The great interest in finding methods of mitigating the potential onslaught of elevated CO_2 and global warming has caused policy makers to look at options that include the use of appropriate technology to gain high benefits for reasonable costs. Decision makers in local, State and Federal governments use research data from **Southern University and A&M College** in **Louisiana** to select tree species to reduce NO_2 and remove ozone pollution. Undergraduate and graduate students have been trained in a project funded under the **1890 Institutions Capacity Building Program**. Researchers are quantifying CO_2 sequestration ability of selected urban tree species, evaluating physiological responses of these species to elevated CO_2, water stress, temperature, and light, and evaluating adaptation of selected species to elevated CO_2 condition. Structure is examined under electron microscopes to detect adaptation features. Preliminary research results have been presented and published. Research results provide valuable information in modeling efforts for predicting the beneficial contribution of trees in urban areas, and understand potential adaptation of species to elevated CO_2 and water stress. These efforts meet the mission and policies of the U.S. Government on global climate change and reduction of greenhouse gases.

The **University of Massachusetts, using McIntire-Stennis Cooperative Forestry formula funding**, has developed a prototype dynamic landscape model to simulate landscape change under a natural fire disturbance regime for forested landscape locations in southwestern Colorado. Researchers have developed parameters for a model using empirical relationships derived for fire ignition and spread processes and forest succession, and they are currently testing the model on neutral landscapes to ensure that each process in the model is implemented correctly. The researchers are also currently developing the prototype wildlife model to assess wildlife population response to landscape dynamics and expect to begin actual simulations of landscape change in the near future. The researchers are working with the U.S. Forest Service, San Juan National Forest, to provide information that will help them in their land management planning process. Specifically, a simulation model will be used to quantify the range of natural variation in landscape structure and assess the impacts of alternative future management scenarios. This information will be vital in the decision-making process for revising the National Forest Plan.

Many factors can contribute to tree and plant species' decline and establishment during vegetation recovery (succession) after timber harvests. A species' decline, however usually is assumed to result primarily from its displacement by more competitive species, a process known as competitive displacement. Researchers at the **University of Washington** have used **National Research Initiative** funds to test this assumption by experimentally manipulating *Senecio sylvaticus*, a winter annual that initially dominates sites harvested for wood, and other potentially competing species often found near individual *Senecio* plants. Surprisingly, the researchers have

found that the presence or absence of such species has significant effect on *Senecio* population dynamics during succession. This counterintuitive result demonstrates that accepted ecological theories must continue to be tested, as unverified assumptions may lead to poor predictions of the recovery of both herbaceous and tree species after timber harvesting.

The magnitude and importance of forest-based economic benefits are rarely accounted for in land use planning or individual decisions involving the conversion of forests to other land uses. The diversity of habitat and wildlife communities is declining, and Connecticut's rural economies lose millions of dollars annually that could be generated from sound timber management and harvesting practices. Funding from the **Renewable Resources Extension Act** and from the **Smith-Lever 3(b) and (c) formula program** has enabled **Connecticut Cooperative Extension** professionals to conduct a variety of educational programs, including the volunteer forest management educators program and the forest stewardship program. In addition, a new web page was developed. These efforts have resulted in 169 landowners developing forest stewardship plans for 14,116 acres. In addition, the forest stewardship program saw an increase of 35 percent in the improved management of woodlots; two coalitions in southern New England formed to sponsor conferences and workshops on forest harvesting safety for professional foresters; and the newly developed web page received 2,385 hits with numerous publication orders and information requests.

Tribal colleges are highly supportive of collaborative efforts to increase regional effectiveness and efficiency. **United Tribes Technical Colleges** in North Dakota supports a collaborative effort with nine other Tribal Colleges on the Northern Plains Bison Education Network. **Haskell Indian Nations University** in Kansas, through a cooperative agreement with USDA and the U.S. Department of Energy, works with several other Tribal Colleges to develop and implement a Natural Resources Management model. These efforts are supported with funding from the interest earned from the **Tribal Colleges Endowment Fund.**

Skaneateles and Otisco Lakes are sources of drinking water for residents in Onondaga County in New York. A majority of the residents in the Skaneateles and Otisco Lake Watersheds receive their drinking water directly from the lakes or from private wells. Smith-Lever 3(d) Water Quality funding is enabling extension professionals in Onondaga County to offer a Home°A°Syst program to homeowners in the area of the Watersheds. The program consists of educational workshops, consultation with individuals, and well water testing. Approximately 50 homeowners have met with extension educators under the Home°A°Syst program to conduct environmental risk assessments of their properties. Actions taken by homeowners as a result of these meetings include septic tank pumping, planting of woody vegetation along the shore, water testing, and proper disposal of hazardous chemicals. As a result of water testing, six people found *E. coli* in their well water and implemented treatment methods to remediate this problem.

Goal 5 - Enhanced Economic Opportunity and Quality of Life Among Americans

Goal Overview

In a world with access to information anytime and anyplace, it takes an understanding of the up-close and personal problems people encounter in their communities to be effective at solving problems. The research, extension, and education programs supported by the USDA/land-grant partnership bring world-class expertise to solving problems and improving the quality of life of citizens in rural, suburban, and urban communities.

Selected Examples of Recent Progress that Contribute to Goal 5

Nearly 10 percent of South Dakota's population is Native American. As the state with the third largest land area dedicated to Native American Reservations, the Native American culture is a large part of South Dakota's ethnic heritage. However, Native American students have historically not attended college. This lack of post-secondary training makes it very difficult for Native Americans to qualify for higher paying jobs. This is reflected in the exceptionally high poverty rates on Native American Reservations. Culture plays a large role in why Native American students do not attend college. The Lakota Culture places a strong value on the extended family. It is not acceptable for young people to leave the family, even to get an education. Support from the **Multicultural Scholars Program** has enabled **South Dakota State University's** (SDSU) College of Agriculture and Biological Sciences and College of Family and Consumer Sciences to initiate the "2+2+2 Project." This project promotes seamless education for Native American students during the last 2 years of high school, two years at a tribal college on the Reservation, and two years at SDSU. The goal is to increase the number of Native Americans earning baccalaureate degrees in agriculture, biological sciences, and family and consumer sciences; while at the same time honoring the traditional values of the Lakota culture. Components of the program include: experiential learning, articulation agreements, scholarships, campus visits, and distance education. More than 200 Native American students are now participating in this program. Their involvement ranges from classroom experience, to apprenticeships, summer institutes, and educator visits. The 2+2+2 program is a strong effort to expand collaboration (in this case in the academic programs area) between 1862 and 1994 land grant institutions. In addition to the work with students, the project has advanced the institutional connection and helped to develop positive, trusting relationships between faculty and administrators at the state's tribal colleges and SDSU.

As an investment in healthy, successful young people, New Mexico's 4-H program continues to reach out to all groups, including at-risk youth, young children, Hispanics and Native Americans. The 4-H Program is supported nationally with Smith-Lever 3(b) and (c) formula funding. New Mexico's fastest-growing 4-H program, Cloverbuds, provides learning activities for 5- to 8-year-olds not yet old enough to join 4-H as junior members. Parental involvement, small groups and hands-on activities provide positive, nurturing learning for youngsters. New Mexico developed "Gifts of Gold," the first Cloverbuds curriculum accepted into the juried national 4-H

library and offered to educators and child-care programs across the country. With a population that is 40 percent Hispanic and nearly 10 percent Native American, New Mexico places a high value on diversity in 4-H. Of the more than 52,000 youth that participated in 4-H programs in 1998, 40.6 percent were Hispanic and 15.3 percent were Native American. A recruiting video and additional materials have been translated into Navajo, and a recruiting brochure has been printed in Spanish. As a result of its success in meeting the needs of its young people, New Mexico 4-H enrollment grew from 33,131 in 1995-96 to 52,005 in 1997-98.

Equipment and instrumentation for teaching are limited at many Tribal Colleges. **Haskell Indian National University** in **Kansas** recently received accreditation of its Bachelor of Science in Environmental Sciences program. This can be attributable, in part, to the purchase of equipment with funding from the **Tribal Colleges Education Equity Grants Program.**

In the ten years from 1985-1995, the juvenile violent crime arrest rate in Pennsylvania increased by 104 percent, the number of teenagers dropping out of school increased by 29 percent, and families with children headed by a single parent increased by 28 percent. In order to address the needs of this special population, **Pennsylvania State University Extension**, with **4-H Program** funding from **Smith-Lever 3(b) and (c)** and **Children, Youth, and Families at Risk** funding from **Smith-Lever 3(d)**, offer assistance through the juvenile justice system in many counties. Extension professionals work with students referred by schools and probation offices as well as adjudicated youth to assist them in developing life skills through training in communications, food and nutrition, financial management, and gardening and plant science. Other referred youth across the state also work on gardening and horticulture projects while learning about food preparation, food safety, food preservation, money management skills for food shopping, and developing nutritionally balanced meals.

There continues to be a shortage of quality child care available to all families who need it. **Iowa State University Extension** is using funding from the **Children, Youth, and Families at Risk program** supported under **Smith-Lever 3(d)** to help address this issue. Child care quality and professional development were addressed through traditional workshops and an innovative video self-study program that offers comprehensive education for early childhood educators and child care providers. Eleven "Child Care that Works" self-study video programs were placed in every Iowa county and accessed by more than 2,600 individuals. This program was approved by the Iowa Department of Human Services as a primary method for meeting licensing requirements. Continuing Education Units are also available to help Head Start teachers meet their professional development requirements. High quality early childhood information is also available through the World Wide Web. ISU Extension provides on-going leadership for the National Network for Child Care (NNCC) website. It contains more than 2,000 early childhood documents from 37 land-grant universities. One hundred seven new child care centers and family child care programs serving more than 2,300 children were established or stengthened. The NNCC website currently receives more than 95,000 hits per month. International hits from 128 countries average 90 hits per month.

COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

BUILDINGS AND FACILITIES

PROJECT STATEMENT

(On basis of appropriation)

(Includes Carryover Balances)

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
HAWAII:							
Center for Applied Aquaculture.	$574,247		$2,012,347		$-2,012,347	–	
MASSACHUSETTS:							
Ctr. for Hunger, Poverty, Nutrition & Policy, Tufts University	–		795,400		-795,400	–	
Federal Administration	[- -]		[- -]		[- -]	[- -]	
Fed. Adm. Carryover	424,251		250,179		-250,179	–	
Total Building and Facilities obligations estimate	998,498	1	3,057,926	1	-3,057,926	–	–
Unobligated Balance:							
Available, start of year	-4,056,424		-3,057,926		+3,057,926	–	
Available, end of year	3,057,926		–		–	–	
Total, Appropriation	–	1	–	1	–	–	–

Cooperative State Research Service

Status of Buildings and Facilities

The status of CSREES-supported buildings and facilities is as follows:

Location and Facility	Year	Purpose	Funds Provided		Description
Auburn University, Auburn, AL	1995	Planning	522,000		Design work continues.
Poultry Science Facility	1996	Planning and Construction	1,338,000		
	1997	Construction	4,140,000		
		Total	6,000,000		
University of Arkansas, Fayetteville	1992	Report		(a)	Project abandoned by University. Funds were redirected to the Animal Science and Research Facility at the University of Arkansas.
Restoration of Carnall Hall	1995	Planning and Construction	(946,000)		
	1996	Planning and Construction	(1,000,000)		
		Total	(1,946,000)		
University of Arkansas, Fayetteville	1995	Planning and Construction			Construction ongoing. Funds were obtained from the Restoration of Carnall Hall facility at the University of Arkansas.
Animal Science and Research	1996	Planning and Construction	946,000		
Facility		Total	1,000,000		
			1,946,000		
Univ. of California, Davis/Riverside	1991	Report		(a)	Design and planning are ongoing at the Davis campus. Construction ongoing at Riverside campus.
Alternate Pest Control	1992	Planning and Construction	207,000		
Containment and Quarantine	1993	Construction	176,000		
Facility	1994	Construction	2,086,000		
	1995	Construction	1,893,000		
	1996	Construction	3,057,000		
	1997	Construction	3,500,000		
		Total	10,921,000		

Location and Facility	Year and Purpose		Funds Provided		Description
Colorado State Univ, Fort Collins	1993	Report		(a)	Construction is completed.
Animal Reproduction and	1994	Planning	320,000		
Biotechnology Facility	1995	Construction	1,231,000		
	1997	Construction	1,100,000		
		Total	2,651,000		
University of Connecticut, Storrs	1994	Report		(a)	Construction ongoing.
Agricultural Biotechnology Lab	1995	Planning and Construction	568,000		
	1996	Construction	1,347,000		
	1997	Construction	2,000,000		
		Total	3,915,000		
University of Delaware, Newark	1993	Report		(a)	Construction completed.
Poultry Biocontainment Lab	1994	Planning	329,000		
	1995	Construction	1,420,000		
	1996	Construction	1,751,000		
		Total	3,500,000		
University of Florida, Gainesville	1995	Report		(a)	Construction ongoing.
Aquatic Research Facility	1996	Planning and Construction	1,500,000		
Oceanic Institute,	1988	Planning and Construction	6,375,000		Multiple sites; design work ongoing at
Waimanalo, Hawaii	1994	Planning and Construction	2,086,000	(b)	some sites, construction ongoing at
Center for Applied Aquaculture	1995	Planning and Construction	1,495,000	(b)	other sites.
		Total	9,956,000		
University of Idaho, Moscow	1990	Report		(a)	Construction underway.
Agricultural Biotechnology	1991	Planning and Construction	590,000		
Facilities	1992	Construction	500,000		
	1993	Construction	431,000		
	1994	Construction	835,000		
	1995	Construction	1,761,000		
	1995	Rescinded	(1,761,000)		
	1997	Construction	3,544,000		
		Total	5,900,000		

Location and Facility	Year	Purpose	Funds Provided		Description
DePaul University, Chicago, IL	1995	Planning and Construction	435,000		Construction completed.
Biological and Environmental	1997	Construction	4,565,000		
Science Facility		Total	5,000,000		
Northwestern University,	1991	Report		(a)	Construction completed.
Evanston, IL	1992	Construction	600,000		
Biotechnology Center	1993	Construction	517,000		
	1994	Construction	835,000		
	1995	Construction	3,218,000		
	1996	Construction	1,366,000		
	1997	Construction	2,000,000		
		Total	8,536,000		
Louisiana State University,	1995	Report		(a)	Design continues.
Baton Rouge, LA	1996	Planning and Construction	1,280,000		Construction underway.
Mississippi State University,					
Poplarville, MS					
Animal Research Facilities (funding supports construction of two facilities, one at each institution)					
University of Maryland, College Park	1991	Report		(a)	Design, planning and
Institute for Natural Resources and	1992	Planning and Construction	1,000,000		construction are
Environmental Science	1993	Construction	862,000		ongoing.
	1994	Construction	1,669,000		
	1995	Construction	1,893,000		
	1996	Construction	2,288,000		
	1997	Construction	2,288,000		
		Total	10,000,000		

Location and Facility	Year and Purpose		Funds Provided		Description
Tufts University, Boston, MA	1991	Report		(a)	Design work continues.
Center for Hunger, Poverty,	1992	Planning and Construction	562,000		
Nutrition and Policy	1993	Construction	484,000		
	1994	Construction	2,202,000		
	1995	Construction	2,461,000		
	1996	Construction	1,641,000		
	1997	Construction	820,000	(b)	
		Total	8,170,000		
University of Mississippi, Oxford	1992	Planning and Construction	100,000		Construction ongoing.
Center for Water and Wetlands	1993	Construction	86,000		
Resources	1994	Construction	94,000		
	1995	Construction	1,420,000		
	1996	Construction	1,555,000		
		Total	3,255,000		
University of Mississippi, Oxford	1995	Report		(a)	Construction ongoing.
National Food Service Management	1996	Planning and Construction	3,000,000		
Institute					
Missouri Botanical Garden, St. Louis	1994	Report		(a)	Construction completed.
Center for Plant Biodiversity	1995	Planning	757,000		
	1996	Planning and Construction	3,995,000		
	1997	Construction	3,161,000		
		Total	7,913,000		

Location and Facility	Year and Purpose		Funds Provided		Description
Rutgers Univ., New Brunswick, NJ	1988	Feasibility Study	50,000		Construction ongoing.
Center for Molecular Biology	1989	Planning	250,000		
	1990	Construction	89,000		
	1991	Construction	2,544,000		
	1992	Construction	3,044,000		
	1993	Construction	2,623,000		
	1994	Construction	2,189,000		
	1995	Construction	3,785,000		
	1996	Construction	2,262,000		
	1997	Construction	1,000,000		
		Total	17,836,000		
New Mexico State University, Las Cruces	1993	Report		(a)	Construction ongoing.
	1994	Planning	798,000		
Center for Arid Land Studies	1995	Planning and Construction	1,420,000		
	1996	Construction	1,464,000		
	1997	Construction	5,044,000		
		Total	8,726,000		
Cornell University, Ithaca, NY	1992	Planning and Construction	375,000		Construction completed.
Cornell Research Greenhouse	1993	Construction	232,000		
		Total	607,000		
New York Botanical Garden, Bronx	1991	Report		(a)	Construction ongoing.
Library/Herbarium	1992	Planning and Construction	1,350,000		
	1993	Construction	3,697,000		
	1994	Construction	2,503,000		
	1995	Construction	3,785,000		
	1996	Construction	1,665,000		
		Total	13,000,000		

Location and Facility	Year and Purpose		Funds Provided		Description
Wake Forest University, Winston-Salem, NC	1990	Planning and Construction	2,853,000		Construction ongoing.
Center for Research on Human	1992	Construction	1,825,000		
Nutrition and Chronic Disease	1993	Construction	3,684,000		
Prevention	1994	Construction	3,074,000		
	1995	Construction	2,672,000		
	1996	Construction	3,000,000		
	1997	Construction	1,000,000		
		Total	18,108,000		
Minot State University, Minot, ND	1992	Planning and Construction	240,000		Construction completed.
Institute for Agricultural and Rural	1993	Construction	1,939,000		(Funds rescinded in FY 1995).
Human Resource Development	1995	Construction	2,600,000		
	1995	Rescinded	(280,000)		
	1996	Construction	400		
		Total	4,499,400		
University of Toledo, Toledo, OH	1993	Report		(a)	Construction completed.
Lake Erie Soil and Water Research	1994	Planning	263,000		
and Education Center	1995	Construction	229,000		
	1997	Construction	2,308,000		
		Total	2,800,000		
Oklahoma State University, Stillwater	1995	Report		(a)	Design work continues.
Grain Storage Research and	1996	Planning	495,000		
Extension Center					
Oregon State University, Corvallis	1995	Report		(a)	Construction completed.
Forest Ecosystem Research Lab	1996	Planning and Construction	5,000,000		
	1997	Construction	5,000,000		
		Total	10,000,000		

Location and Facility	Year and Purpose		Funds Provided		Description
St. Joseph's University, Philadelphia	1991	Planning	600,000		Construction completed.
Center for Food Marketing	1992	Construction	2,710,000		
	1993	Construction	2,336,000		
	1994	Construction	1,950,000		
	1995	Construction	2,366,000		
	1996	Construction	2,438,000		
		Total	12,400,000		
University of Rhode Island, Kingston	1990	Report		(a)	Construction ongoing.
Coastal Institute on Narragansett Bay	1991	Planning and Construction	1,904,000		
	1992	Construction	500,000		
	1993	Construction	431,000		
	1994	Construction	3,109,000		
	1995	Construction	2,702,000		
	1996	Construction	3,854,000		
		Total	12,500,000		
South Dakota State University, Brookings, SD	1995	Report		(a)	Design work continues.
	1996	Planning and Construction	2,700,000		
Animal Resource Wing	1997	Construction	2,700,000		
		Total	5,400,000		
University of Tennessee, Knoxville	1992	Planning and Construction	925,000		Construction ongoing.
Agricultural, Biological and	1993	Construction	797,000		
Environment Research Complex	1994	Construction	1,668,000		
	1995	Construction	2,386,000		
	1996	Construction	1,928,000		
	1997	Construction	2,750,000		
		Total	10,434,000		
Middle Tennessee State University, Murfreesboro	1995	Report		(a)	Design work continues.
	1997	Planning and Construction	2,585,000		
Horse Science and Teaching Center					

Location and Facility	Year and Purpose		Funds Provided		Description
Texas A&M University, College Station	1993	Report		(a)	Construction ongoing.
	1994	Planning	584,000		
Center for Southern Crop Improvement	1995	Construction	508,000		
	1996	Construction	1,400,000		
	1997	Construction	4,508,000		
		Total	7,000,000		
University of Vermont, Burlington	1995	Report			Construction completed.
Rural Community Interactive Learning Center	1996	Planning and Construction	2,000,000	(a)	
	1990	Report		(a)	Construction completed.
Washington State University, Pullman	1991	Planning and Construction	1,210,000		
	1992	Construction	2,120,000		
Animal Disease Biotechnology Facility	1993	Construction	2,258,000		
	1994	Construction	4,799,000		
	1995	Construction	4,172,000		
	1996	Construction	1,263,000		
	1997	Construction	7,578,000		
		Total	23,400,000		
Washington State University, Pullman	1995	Planning and Construction	426,000		Construction completed.
	1996	Construction	3,251,000		
Wheat Research Facility		Total	3,677,000		

Location and Facility	Year and Purpose	Funds Provided	Description

Footnotes:

(a) Funds were provided to the Cooperative State Research, Education, and Extension Service for the purpose of reporting to Congress on the need for this facility.

(b) Part of these funds carried over to fiscal year 2000.

ECONOMIC RESEARCH SERVICE

Purpose Statement

The Economic Research Service (ERS) was established in 1961 from components of the former Bureau of Agricultural Economics principally under the authority of the Agricultural Marketing Act of 1946 (7 U.S.C. 1621-1627). ERS's portfolio was expanded to include international work with the addition of country specialists from the Office of Foreign Agricultural Relations. ERS performs work under one appropriation item--economic analysis and research. ERS's FY 2000 budget was funded at $65.4 million by the FY 2000 Appropriations Act for Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, 2000 (Public Law 106-78).

The mission of the Economic Research Service is to provide economic analysis on efficiency, efficacy, and equity issues related to agriculture, food, natural resources, and rural development to improve public and private decision making.

Activities to support this mission and the following goals involve research and development of economic and statistical indicators on a broad range of topics including, but not limited to global marketing conditions, trade restrictions, agribusiness concentration, farm and retail food prices, food assistance, food borne illnesses, food labeling, nutrition, worker safety, agrichemical usage, livestock waste management, conservation, sustainability, genetic diversity, technology transfer, biofuels, rural infrastructure, and agricultural labor. Research results and economic indicators on such important agricultural, food, natural resource, and rural issues will be fully disseminated to public and private decision makers through published and electronic reports and articles; special staff analyses, briefings, presentations, and papers; data bases; and individual contacts. Through such activities, ERS provides public and private decision makers with economic and related social science information and analysis that helps them attain the goals that promote agricultural competitiveness, food safety and security, a well nourished population, environmental quality, and a sustainable rural economy. More information on ERS's program is contained in the ERS Strategic Plan and Annual Performance Plan.

Headquarters of the Service is in Washington, D.C. ERS does not have any field offices. As of September 25, 1999 there were 462 permanent full-time employees, and 61 other than permanent full-time employees.

ECONOMIC RESEARCH SERVICE

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	2001 Estimated Amount	2001 Estimated Staff Years
Economic Research Service	62,488,449	506	65,363,000	506	55,424,000	517
Obligations under other USDA appropriations:						
Agricultural Marketing Service	40,000	-	100,000	-	100,000	-
Agricultural Research Service	117,445	-	130,000	-	130,000	-
Animal and Plant Health Inspection Service	35,000	-	40,000	-	40,000	-
Cooperative State Research, Education and Extension Service	137,446	-	150,000	-	150,000	-
Farm Service Agency	10,000	-	10,000	-	10,000	-
Foreign Agricultural Service	1,420,024	5	1,860,000	5	1,860,000	5
Forest Service	10,000	-	50,000	-	50,000	-
National Agricultural Statistics Service	46,906	-	60,000	-	60,000	-
Natural Resources Conservation Service	10,000	-	10,000	-	10,000	-
Office of the Chief Economist	70,630	-	70,000	-	70,000	-
Risk Management Agency	1,025,099	-	1,500,000	-	1,500,000	-
Commodity Credit Corporation	5,000	-	10,000	-	10,000	-
World Agricultural Outlook Board	3,000	-	10,000	-	10,000	-
Total, Other USDA Appropriations	2,930,550	5	4,000,000	5	4,000,000	5
Total, Agriculture Appropriations	65,418,999	511	69,363,000	511	59,424,000	522
Other Federal Funds:						
Department of Health and Human Services	70,000	-	-	-	-	-
Total, Other Federal Funds	70,000	-	-	-	-	-
Non-Federal Funds:						
User Fees	209,785	-	400,000	-	400,000	-
Total, Non-Federal Funds	209,785	-	400,000	-	400,000	-
Total, Economic Research Service	65,698,784	511	69,763,000	511	59,824,000	522

ECONOMIC RESEARCH SERVICE

Permanent Positions by Grade and Staff-Year Summary

1999 Actual and Estimated 2000 and 2001

Grade	1999 Wash, DC	2000 Wash, DC	2001 Wash, DC
ES-6	1	1	1
ES-5	1	1	1
ES-4	1	1	1
ES-3	1	1	1
ES-2	1	1	1
ES-1	1	2	2
SL	1	1	1
GS-15	48	48	48
GS-14	104	104	104
GS-13	155	160	165
GS-12	48	53	59
GS-11	19	19	20
GS-10	1	1	1
GS-9	19	21	21
GS-8	27	27	27
GS-7	18	18	18
GS-6	20	20	20
GS-5	5	5	5
GS-4	5	5	5
GS-3	1	1	1
GS-2	1	1	1
Total Permanent Positions	478	491	503
Unfilled Positions, end-of-year	16	-	-
Total Permanent, Full-Time Employment, end-of-year	462	491	503
Staff-Year Ceiling	511	511	522

ECONOMIC RESEARCH SERVICE

CLASSIFICATION BY OBJECTS
1999 Actual and Estimated 2000 and 2001

		1999	2000	2001
Personnel Compensation				
Washington, D.C.				
11	Total personnel compensation	33,777,651	33,944,000	34,978,000
12	Personnel benefits	5,998,156	6,031,000	6,357,000
13	Benefits for former personnel	6,701	7,000	7,000
	Total personnel compensation	39,782,508	39,982,000	41,342,000
Other Objects				
21	Travel	634,745	635,000	933,000
22	Transportation of things	80,308	80,000	78,000
23	Communications, utilities, and miscellaneous charges	623,201	623,000	623,000
24	Printing and reproduction	330,972	331,000	379,000
25.2	Other services	4,405,541	2,062,000	1,500,000
25.3	Purchases of goods and services from Government accounts	4,151,631	6,352,000	4,444,000
25.4	Operation and maintenance of facilities	66,175	66,000	66,000
25.5	Research and development contracts and agreements	7,562,865	10,380,000	3,500,000
25.7	Operation and maintenance of equipment	361,123	361,000	361,000
25.8	Subsistence and support of persons	99,680	100,000	95,000
26	Supplies and materials	824,972	826,000	721,000
31	Equipment	1,435,567	1,436,000	1,382,000
41	Grants	2,128,497	2,129,000	0
43	Interest	664	0	0
	Total other objects	22,705,941	25,381,000	14,082,000
Total direct obligations		62,488,449	65,363,000	55,424,000
Position Data				
Average Salary, ES positions		120,732	125,079	128,737
Average Salary, GS positions		65,582	67,943	69,930
Average Grade, GS positions		12.0	12.0	12.0

ECONOMIC RESEARCH SERVICE

The estimates include appropriation language for this item as follows (new language underscored; deleted mater enclosed in brackets).

Salaries and Expenses

For necessary expenses of the Economic Research Service in conducting economic research and analysis, as authorized by the Agricultural Marketing Act of 1946 (7 U.S.C. 1621-1627) and other laws, [$65,419,000] $55,424,000; Provided, [That $1,000,000 shall be transferred to and merged with the apropriation for "Food and Nutrition Service, Food Program Administration" for studies and evaluations: Provided further,] That this appropriation shall be available for employment pursuant to the second sentence of section 706(a) of the Organic Act of 1944 (7 U.S.C. 2225).

This change proposes deletion of language for food assistance program evaluation studies which are included in the Food and Nutrition Service budget in FY 2001.

SALARIES AND EXPENSES - CURRENT LAW

Appropriations Act, 2000		$65,419,000
Budget Estimate, 2001		55,424,000
Decrease in Appropriation		-9,995,000
Adjustments in 2000:		
Appropriations Act, 2000	$65,419,000	
Rescission under P.L. 106-113	-56,000	
Adjusted base for 2000		65,363,000
Budget Estimate, 2001		55,424,000
Decrease from adjusted 2000		-9,939,000

ECONOMIC RESEARCH SERVICE

SUMMARY OF INCREASES AND DECREASES
(On Basis of Adjusted Appropriation)

Item of Change	2000 Estimated	Program Changes	2001 Estimated
Estimate the Benefits of Increased Food Safety	453,000	-	453,000
Carbon Sequestration	-	700,000	700,000
Structural Change, Coordination, and Concentration in Food and Ag.	-	1,056,000	1,056,000
Global Research, Statistics and Outreach	-	500,000	500,000
Evaluate Food Assistance Programs	12,195,000	-12,195,000	-
All Other	52,715,000	-	52,715,000
Total Available	65,363,000	-9,939,000	55,424,000

ECONOMIC RESEARCH SERVICE

PROJECT STATEMENT
(On Basis of Adjusted Appropriation)

	1999 Actual		2000 Estimated		Increase or Decrease	2001 Estimated	
	Amount	Staff Years	Amount	Staff-Years		Amount	Staff-Years
Economic Analysis and Research	62,488,449	506	65,363,000	506	-9,939,000	55,424,000	517
Unobligated Balance	477,526		-				
Total, Available or Estimate	62,965,975	506	65,363,000	506	-9,939,000	55,424,000	517
Rescission a/	-		56,000				
Transfer to the Office of the Chief Economist	791,025						
Total, Appropriation	63,757,000	506	65,419,000				

a/ Rescission of $56,000 due to P.L. 106-113.

JUSTIFICATION OF INCREASES AND DECREASES

(1) A net decrease of $9,939,000 for economic analysis and research ($65,419,000 available in 2000) consisting of:

(a) An increase of $1,056,000 for an initiative on Structural Changes and Concentration in Food and Agriculture to improve the efficiency of the Agricultural Sector.

Initiative Overview:

This initiative proposes to greatly enhance research and communication activities related to structural changes within the food and fiber system. Traditional agricultural markets have been characterized by a large number of buyers and sellers trading homogeneous commodities. However, significant market concentration has occurred in all aspects of the agricultural sector. Contractual arrangements and vertical integration are replacing sales on open markets. Meanwhile, consumer and processor preferences, together with technological advances such as biotechnology, have led to more heterogeneous farm products. These changes can have far reaching impacts on farmers, consumers, rural communities, and U.S. competitiveness in the agricultural sector. Through this initiative, ERS will shed light on the desired role of agricultural policy in this new structural environment. Since significant changes in market structure create major challenges for researchers, this initiative will look at new ways of examining markets and conducting aggressive data collection programs.

The initiative contributes to the following USDA and REE mission area goals: (1) An Agricultural System that is Highly Competitive in the Global Economy and (5) Enhanced Economic Opportunity and Quality of Life for Rural Americans. This initiative will examine structural changes in agriculture and food sectors to gain a better understanding of the potential impact on competitiveness of industries at home and abroad. The research plan will also examine opportunities for smaller farmers and rural communities to remain viable in the changing structural environment.

Background:

Agriculture is a dynamic industry capable of sudden and dramatic changes. Examples include consolidation in the meat packing industry and the resulting shift away from spot markets to direct contracts with livestock growers; a series of mergers in the grain processing, agri-chemical, and seed industries; and increases in the overall scale of individual production units. Such issues raise serious concerns about what the ultimate effects on growers, consumers, and processors will be.

These changes have been linked to the shifting market structure and the industrialization of the agricultural sector. Industrialization is associated with a range of structural changes, including larger firm size, specialized production methods, vertical coordination, and concentration. In this process, farms and factories typically become much larger and more specialized. Also, buyers and sellers of agricultural commodities often change the way they do business, relying less on cash markets and more on contractual methods of buying and selling.

One concern is that concentration that may limit competition. A concentrated group of sellers in agricultural input markets can charge prices above the competitive level. Similarly, a concentrated group of buyers in output, or commodity, markets can pay lower prices than would prevail in a competitive situation. Farmers, caught in the middle, could face an income squeeze between higher input prices and lower output prices. Also, reduced competition may limit the opportunities for society to gain from industrialization by limiting the spread of innovations.

Concentration is a concern in several key agricultural industries closely linked to farmers. Examples include recent railroad mergers that left only two major carriers serving grain shippers in the West and the sharp increases in meat packer concentration that may affect livestock producers. Another example is the sale of Continental Grains merchandising business to Cargill, which came under scrutiny of the Department of Justice. Also, recent mergers and acquisitions of major agrochemical and seed companies could leave much of the important research and development in biotechnology in the hands of only few companies.

Recently, the *National Small Farm Commission* recommended that priority be given to the development of farmer owned, value-added cooperatives and farm-based businesses; that action should be taken to prohibit discriminatory pricing practices in meat packing; and that legislation should be developed to address contract termination, duration, and re-negotiation. The development of policies to address these concerns requires careful analysis of the issues, their causes and potential remedies, and the distribution of impacts. ERS is uniquely positioned to develop a program that will address this research need.

Research Activities and Specific Issues:

ERS would initiate three broad activities: (1) Determine where concentration is occurring in the agricultural marketing chain, who is affected, and how; (2) Develop and explore opportunities for farmers within this kind of market environment – how can farmers cope, adjust and benefit from these developments; and (3) Examine ways is which the USDA and other parts of government can aid farmers in adjusting to structural changes in agriculture.

Identifying Market Concentration and Assessing Economic Impacts. Concentration is occurring throughout the marketing chain. There is a need to accurately measure the extent of concentration in these different economic sectors, understand why it is occurring, and determine the impact it has on input and commodity prices and on farm income. While concentrated markets may affect prices for all farmers, some rural areas may suffer disproportionately because of their dependence on a smaller selection of input suppliers or commodity markets in their local areas. This initiative will seek to identify how farmers and rural communities are affected by concentration. Research would also consider those who are not part of the main-stream supply chain and how they are affected by these developments.

This research would develop and enhance ERS's ability to measure and analyze changes in concentration and to provide technical assistance to USDA and the Department of Justice regarding expected impacts of concentration and merger activity. ERS would enhance its capacity to anticipate significant changes in markets and their potential economic impacts on farmers and consumers. This initiative will aid in expanding and targeting data collection on market activity and the identification of the small and mid-size farms that are affected by these developments. These changes in the structure of agriculture are complex and are evolving. ERS has established an Agency-wide team to consider these issues and to identify the additional research and analytical capacity needed to effectively address them. Funding from this initiative will be used to expand ERS's capacity to analyze economic impacts of concentration, through internal and extramural research, as well as the development of additional needed staff.

Marketing Arrangements and Opportunities for Farmers. Marketing arrangements, like contracting and various forms of vertical integration, have emerged as important channels for moving products from producers to processors and on to consumers. Such arrangements may limit the ability of smaller independent producers to compete, especially if the contracting arrangements, which are not publicly available, result in price discrimination. Their ability to compete may also be limited by the large delivery requirements of large buyers. Contracts and vertical integration limit market outlets for the smaller independent producers who are relegated to trading on the open spot market, where prices may become more volatile and subject to manipulation because they are based on fewer trades. This may lead to misallocated resources and lower social welfare. Finally, quality premiums offered on the open market

may not reward producers for delivering highly valued product attributes. This initiative will augment the development of expertise to examine these forms of market coordination and identify how and when farmers are helped and hurt by these arrangements. An important question for policy design and enforcement is to determine when contractual arrangements lead to price discrimination and other possible detrimental forms of market power or when it produces a more efficient means of producing food that benefits farmers and consumers. This initiative will explore the government's role in markets characterized by trade on the open market, contractual arrangements, and vertically integrated operations.

This initiative will fund research to explore cooperative arrangements, the potential for their further development, and government's role in promoting and strengthening them. Cooperatives represent opportunities for farmers to gain more leverage in the marketplace. While cooperatives have existed for a long time, their importance has grown as a form of countervailing power to gain bargaining clout in both input and output markets. Other marketing opportunities will also be examined such as direct marketing, niche marketing, and making use of information technology and other marketing innovations.

Relationship to ERS's Current Program

ERS is responsible for conducting economic analysis on the efficiency of agricultural and food markets, and the distribution of costs and benefits throughout the food marketing system. This initiative will provide a foundation for continuing analysis of rapid structural changes in food and agricultural markets to aid in policy decisions related to market regulation, information services, and rural development.

(b) **An increase of $500,000 for ERS activities contributing to the REE "Global Research and Outreach Initiative in Support of the U.S. Food and Agriculture Sectors" to improve ERS' beneficial collaborations with other nations.**

Initiative Overview:

The REE Mission Area proposes an interagency initiative to focus research and outreach programs on international issues of vital interest to the U.S. food and agriculture sector and on alleviation of causes of global food insecurity. The proposed program recognizes the increasing interdependence of U.S. and world markets, the critical role of agriculture in alleviating food insecurity and stimulating economic development, and the importance of economic development in developing countries as a source of future growth in demand for U.S. exports. The proposed program also recognizes the mutual benefit from closer collaboration between U.S. and foreign institutions that conduct agricultural research and education programs. These benefits take the form of better science, more efficient technology transfer, better information for market and policy decisions, and, ultimately, a safer, more secure world food supply, and a more prosperous agriculture.

Two types of programs will be supported by the initiative: (1) competitive grants to facilitate globalization of U.S. agricultural colleges and universities, and to combat causes of food insecurity; and (2) research on issues of importance to the United States but requiring collaboration of a foreign institution. The ERS activities to be supported by this initiative and described below are of type (2).

Background:

Economic research, analysis and information systems are important to the competitiveness and vitality of a country's agricultural economy and its contribution to the general economy and to food security. The U.S. agricultural sector is increasingly dependent on foreign market growth and open to competition from imports in domestic markets; thus, reliable, timely information about conditions in other countries is more important than ever.

Many developing and transitions countries have very limited institutional capacity to produce the kinds of data and analysis needed. In these cases the best way for the U.S. to get access to the kinds of economic information needed is to assist through collaborative activities, the development of indigenous institutional and human capacity to produce this information. In the process, the U.S. gets needed information and develops institutional and professional relationships that will facilitate long term exchanges and continuing access to needed information and data. In developed countries, this initiative will help increase the incentives to generate such information, both for internal use and to share with the United States.

Research Activities and Specific Issues:

Research and outreach activities. ERS has already established a number of mutually beneficial relationships with appropriate institutions in transition and developing countries. These prior relationships will be assessed to determine those that offer potential for supporting substantive research on relevant problems and for producing, in the long term, sustainable institutional capacities in the partner country. Three sets of country/institutional linkages will be examined. First are countries with whom we have a history of collaboration that will be considered are Poland, the Czech Republic, Slovakia, Bulgaria, Romania, Ukraine, Russia, Mexico and China. Second are countries with whom we have little history of collaboration but with whom we share numerous important economic and policy issues and problems which will be evaluated and approached selectively. These include Brazil, Argentina, Chile, South Africa, Indonesia, South Korea, Thailand and India. The third set of country/institutional linkages that will be explored are with the Organization for Economic Cooperation and Development countries that have well developed institutional capacity and with whom we have mutual problems or conflicts for which a joint research effort can contribute more efficient market performance and more effective policy formulation (or negotiation). These countries include the E.U. and its member countries, Japan, Canada, Australia and New Zealand.

The kinds of problems and issues on which research will focus include producer and consumer incentives in transition (mixed) economies; factors affecting consumer and producer acceptance of new technologies, products or processes (e.g. GMO's); estimating aggregate supply response in countries with significant undeveloped productive capacity (Brazil); macroeconomic linkages to the agricultural economy (Asian economies); the degree to which agricultural and amenity production is joint (E.U., Australia, Japan); the costs and benefits of freer trade for less developed countries; and the effects of food aid on food security in both the long and short term.

Activities designed to strengthen research and outreach capacity in developing countries. ERS will develop programs with institutions in selected developing countries to assist in strengthening the human resource capacity of these institutions through structured, on-the-job-learning experiences for staff (or potential staff) of the developing country institution. The participant would work in ERS on a real project of relevance to both countries for a long enough period to learn both economic analysis skills and how a research institution like ERS functions internally and within the broader public and private institutional context. The on-the-job-experience may also be a component of a degree educational program and planned in cooperation with the university being attended by the participant. Programs may also be structured so as to provide meaningful exposure in other USDA agencies or institutions with responsibilities related to economic research, market analysis and monitoring/reporting.

Relationship to ERS's Current Program:

ERS has a history of collaborative work with institutions in other countries, much in the context of technical assistance. Having budget resources to support these activities will make it possible to choose activities and partners on the basis of program criteria rather than where the money was. Understanding

the global agricultural market and policy environment within which the U.S. food and agriculture sector functions is a central component of ERS mission. The lack of resources to work with and in other countries has long been a constraint on the agency's ability to serve its domestic clientele (public and private) as well as they could be. This initiative will begin relaxing that constraint and be very complimentary with our core program.

(c) **An increase of $700,000 for an initiative on the Economic Incentives for Carbon Sequestration and Trace Gas Emissions Control in Agriculture to provide information that would assist the Agricultural Sector to respond to and mitigate the dangerous effects of greenhouse gases.**

Initiative Overview:
This initiative will focus on the economic potential for domestic carbon sequestration and control of greenhouse gases (GHG) in agriculture, the use of economic incentives to encourage carbon sequestration on agricultural lands, and the potential to target USDA conservation programs to promote GHG mitigation activities in the farm sector.

Background:
International concern that human activities contribute to the natural greenhouse effect of the earth's atmosphere and that additional warming of the earth's surface and atmosphere may adversely affect natural ecosystems and humankind prompted negotiation of the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC was ratified by the United States on October 15, 1992, and put in force on March 21, 1994. Under Article 4, the U.S. and other developed countries that were parties to the treaty were committed to adopt policies and take measures to mitigate climate change.

Concern that the voluntary approach under the UNFCCC has not resulted in sufficient GHG emissions reduction or development of adequate emissions-absorbing terrestrial sinks could lead to further clarification in subsequent international agreements. Further, the U.S. and other countries have implemented some, and are considering implementing other, national-level programs to control emissions independent of international treaty ratification process.

Several key features that efforts would likely include are: national GHG emission reduction targets, programs to encourage development of emissions-absorbing land "sinks" to sequester carbon, and an emissions permit trading system for meeting emissions reduction targets.

Agriculture has an important stake in this process. Over 80% of all U.S. GHG emissions are related to fossil fuel combustion. Therefore it is likely that any strategy to reduce GHG emissions would involve some system of emissions permits which would boost energy prices. U.S. agriculture's dependence on energy intensive inputs (including fertilizers, fuels, and electricity) suggests that such a permit system could significantly raise farm production costs. Alternatively, because farms account for almost half of all land in the contiguous 48 states, agriculture could benefit if terrestrial carbon sinks are allowed to play a significant role in mitigating GHG emissions.

The potential for managing agricultural lands for carbon sequestration is demonstrated by the relationship describing the net effect on GHG emissions associated with any given land-use or production practice as a difference between carbon locked up in a "sink" and carbon released to the atmosphere:

Gross Carbon Emissions - Carbon Sequestered = Net Carbon Emissions.

It is generally accepted that programs boosting sequestration by shifting land from commodity production to forests or permanent grasses will reduce *net carbon emissions*. For lands that remain in production, *carbon sequestered* is affected by the level of crop residue left on and in the field, which in turn, is a

function of crop choice, rotation system, fertilizer use, timing of field operations, and climate. All but climate are management variables. *Gross carbon emissions* are affected by energy input use, the level of biomass removed, the rate of biological oxidation, and the rate of soil erosion. These factors can also be influenced by farm management decisions. Among soil scientists, consensus is emerging that it will soon be technically possible to inventory changes in soil carbon nationwide and thus create the basis to include soil carbon sequestration in international agreements such as the Kyoto Protocol. Much less work has been directed at estimating the size of incentives required to induce different levels of emission reduction and how associated changes in production practices might impact the economic performance of farms and conditions in rural America. There has also been little work done on how a domestic program of tradable emissions permits could be designed to create incentives for carbon sequestration in agricultural soils or how existing USDA conservation programs could be expanded to include soil carbon sequestration along with their current objectives. Work on reducing agricultural emissions of methane and nitrous oxide is similarly limited.

Research Activities and Specific Issues:

ERS would initiate three kinds of activities:
Economic potential for domestic carbon sequestration and trace gas control in agriculture. This component of the work would seek to establish the "supply curve" of trace gas control in agriculture. ERS has begun a three-year cooperative research agreement with the Natural Resource Ecology Laboratory in Colorado to investigate this topic. Funding for the first two years has been provided by the Fund for Rural America. Funding under this initiative would allow completion of the third year.

Economic Incentives for Carbon Sequestration. There are many ways to create economic incentives for sequestering carbon in agriculture. For farmers, however, the economic implications of even relatively specific proposals, such as a system of tradable carbon permits, can be very different depending on how such a program is implemented. Additionally, the nonpoint nature of soil carbon sequestration means that monitoring and enforcement could be a costly component of a tradable permit system. For this reason, other policy mechanisms that have been successfully used in agricultural conservation programs may have merit or there may be ways to target programs such as the Conservation Reserve Program or the Environmental Quality Improvement Program to meet trace gas control goals. Research to use economic valuation techniques to weight multiple objectives to better target these programs is underway at ERS. Initiative funds would allow this work to incorporate carbon sequestration and other trace gas control programs in such targeting schemes.

The Global Potential for Agricultural Trace Gas Mitigation and Sequestration. This component of the initiative would allow ERS to collaborate with researchers around the world to incorporate estimates of carbon sequestration in agricultural soils into global economic models such as ERS's FARM model as well as to consider the potential for other GHG mitigation efforts on agriculture. This would build on modeling work to estimate the impacts of climate change on agriculture and to link this to the broader issue of threats to global agricultural sustainability such as water quantity and quality and land constraints and soil degradation.

Relationship to REE Mission Area Goals and Performance Measures:
The more-developed countries have thus far indicated the greatest commitment to reducing GHG emissions--which follows from the fact that the more-developed countries are most responsible for current atmospheric concentrations of GHGs. Because developing countries compete with U.S. producers, there exists potential for GHG mitigation strategies to affect negatively U.S. agricultural competitiveness. By identifying those U.S. regions and commodities most likely to be put at a competitive disadvantage by various GHG mitigation strategies, this initiative supports REE goal 1 - ensuring U.S. agriculture remains highly competitive in the global economy.

By analyzing the economic potential of alternative practices that increase soil carbon levels, and identifying the most efficient policies to facilitate adoption of soil carbon building practices, this initiative has direct implications for enhancing soil quality and productivity. Hence, the initiative also supports REE Goal 4 - ensuring agriculture and the environment are in harmony.

Finally, one effect of establishing agricultural GHG sinks as a standardized and tradable commodity would be the creation of a new economic interest in farm land -- namely the right to manage it for increased carbon content. By identifying those production practices which increase the quantity of carbon sequestered in and on agricultural lands and those policies which facilitate the creation of markets for that carbon, this initiative supports REE Goal 5 -enhancing economic opportunities and quality of life for rural Americans.

Relationship to ERS's Current Program:
This initiative complements and extends existing ERS programs aimed at assessing: 1) the economic potential for trace gas control in agriculture and 2) the impacts on U.S. agriculture of various climate change mitigation strategies. It also supports ERS efforts to examine the relationship between resource degradation and food security.

(d) A decrease of $12,195,000 to evaluate the USDA food assistance programs

Funding for these evaluation studies in 2001 are included in the Food and Nutrition Service (FNS) budget. Additional justifications on these studies can be found under the FNS Explanatory Notes.

ECONOMIC RESEARCH SERVICE

GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF YEARS
1999 Actual and Estimated 2000 and 2001

	1999		2000		2001	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Alabama	$ 27,000	-	-	-	-	-
Arizona	176,800	-	-	-	-	-
Arkansas	26,000	-	-	-	-	-
California	764,428	-	-	-	-	-
District of Columbia	53,077,897	506	$ 65,363,000	506	$ 55,424,000	517
Florida	90,000	-	-	-	-	-
Georgia	99,828	-	-	-	-	-
Illinois	309,090	-	-	-	-	-
Indiana	169,500	-	-	-	-	-
Iowa	180,000	-	-	-	-	-
Kentucky	44,500	-	-	-	-	-
Louisiana	7,100	-	-	-	-	-
Maryland	406,429	-	-	-	-	-
Massachusetts	3,601,543	-	-	-	-	-
Michigan	220,354	-	-	-	-	-
Minnesota	197,500	-	-	-	-	-
Mississippi	182,900	-	-	-	-	-
Nebraska	755,556	-	-	-	-	-
New Jersey	18,500	-	-	-	-	-
New York	813,212	-	-	-	-	-
North Carolina	212,812	-	-	-	-	-
Ohio	360,000	-	-	-	-	-
Oklahoma	20,000	-	-	-	-	-
Oregon	59,100	-	-	-	-	-
Pennsylvania	15,000	-	-	-	-	-
Tennessee	15,000	-	-	-	-	-
Texas	38,700	-	-	-	-	-
Virginia	271,550	-	-	-	-	-
Washington	155,000	-	-	-	-	-
Wisconsin	173,150	-	-	-	-	-
Subtotal, Available or Estimate	62,488,449	506	65,363,000	506	55,424,000	517
Unobligated balance	477,526	-	-	-	-	-
Total, Available or Estimate	62,965,975	506	65,363,000	506	55,424,000	517

Note: The distribution of 2000 and 2001 funds by State has not been determined at this time

ECONOMIC RESEARCH SERVICE

STATUS OF PROGRAM

Goal 1: The agricultural production system is highly competitive in the global economy.

Objective: Enhanced understanding by policy makers, regulators, program managers, and those shaping public debate of economic issues involved in ensuring that the U.S. food and agriculture sector effectively adapts to changing market structure, technological change, domestic policy reforms, and post-GATT and post-NAFTA trade conditions.

Current Activities: Being competitive in the global economy means being able to create and sustain comparative advantages consistent with resource endowments and technical capabilities. The ERS program aims to assess policies and programs designed or negotiated to break down barriers in order to capitalize on comparative advantage and to identify and analyze market market structure and technological developments that affect efficiency and profitability.

On an ongoing basis, ERS is providing research and analysis on issues relating to the World Trade Organization (WTO) and Regional Trade agreement issues; the North American Free Trade Agreement (NAFTA); domestic policy reforms; the structure and performance of agricultural commodity markets; the state of global food security; crop insurance reform and other forms of risk management; the impacts of public and private agricultural research; technological change, e.g., bioengineered crops; and the distributional impacts of various policy proposals across different types of farms.

These activities are designed to identify and assess factors that affect production efficiency, market performance, and the nuances of competing in a global market, as well as to provide policy makers and decision makers with assessments of programs they operate and alternative outcomes for pending policy decisions. Results have helped shape the public debate on commodity, technology, economic, and trade issues.

ERS also monitors the food marketing system, identifying the new trends in a variety of product introductions and price distributions, and assessing the efficiency of the food supply chain. In particular, ERS is conducting a study of food retail consolidation and trade practices in fresh produce markets.

Selected Examples of Recent Progress:

Managing Market and Environmental Risk in Agriculture. Since the 1996 Farm Act, risk management has assumed a more central and important role in farm well being. ERS published *Managing Risk in Farming: Concepts, Research, and Analysis*, which is a comprehensive treatment of risk and risk management tools and strategies at the farm level. It also provides never-before-published data on farmers' assessments of the risks they face and their use of alternative risk management strategies. Complementing this report, a series of articles in *Agricultural Outlook* examines various risk-related topics, including a discussion of the impacts of subsidized insurance on land use, and the effectiveness of risk management savings accounts. ERS provided timely Internet-based reporting of the impacts of this year's drought on farm income and financial conditions. The drought analysis also is captured in a published report, *An Economic Assessment of the 1999 Drought*.

Global Food Security. As a follow-up to commitments made at the World Food Conference in 1996, ERS conducted research on the nature and scope of global food insecurity. A report, *Food Security Assessment: Why Countries are at Risk*, evaluated the availability and distribution of food, projected long-term trends through the next decade and examined the feasibility of achieving food security by measuring growth prospects of principal factors affecting food security. The 1999 report concluded that food insecurity in many

low-income, developing countries will intensify unless steps are taken to reverse the performance trends of key contributing factors: agricultural productivity, foreign exchange earnings, and population growth. The research results, disseminated through publications and briefings for senior policy makers, were considered by the Inter-Departmental Group on Food Security in its response to the World Food Conference goals, and provided a global context for the development of a strategic research agenda for the Research, Education and Economics (REE) Mission Area of USDA.

Factors Affecting Performance of Agricultural Commodity Markets. Price determination for U.S. agricultural commodities has been influenced over time by the changing structure of commodity markets and by the changing role of agricultural commodity policies, particularly Government price support and stockholding programs. ERS continued its research on the changing nature of price determination in agricultural commodity markets. New pricing models were developed to capture the effects of market supply and demand factors on price determination, as influenced by factors that represent policy changes, international market considerations, and cross commodity pricing effects. These new relationships provide an enhanced analytic base for the Department's short-term market analysis and long-term outlook projections activities. The pricing relationships have additionally been shared with the Congressional Budget Office staff and are being used in their baseline projection activities. Additionally in FY1999, ERS instituted a series of quarterly "Roundtable" discussions with representatives of key commodity and trade associations. The Roundtable meetings highlight various domestic and international issues that have implications for agricultural commodity markets. Issues such as biotechnology in agriculture, alternative futures for the U.S. agriculture sector, and implications of labeling for food and agriculture markets were highlighted in 1999. The Roundtable forum provides ERS with an opportunity for client feedback on specific topical issues and other aspects of the Agency's market analysis and outlook program.

Enhanced Understanding of Agricultural Structure. On an ongoing basis, ERS tracks and explains the structural changes being experienced in the U.S. agricultural and food system, which is particularly important in understanding the heterogeneity of agribusinesses across the nation, and the implications of these differences for policy design. In 1999, ERS analyzed specific structural changes in components of the agricultural sector, exemplified by release of the report *Broiler Farms' Organization, Management, and Performance*. Reducing transaction costs and managing risk are important motives for contracting and vertical integration in the broiler industry, which can result in larger quantities of more uniform and higher quality products for consumers. Another major source of structural change is the growing demand for quality-differentiated products, such as high lysine corn or non-GMO soybeans. The advent of biotechnology makes the prospects for product differentiation almost limitless. ERS is consequently turning its attention to the implications of commodity differentiation for market structure, market information needs, and Government programs.

World Trade Organization Negotiations. *Agriculture in the WTO* analyzed how Uruguay Round commitments were implemented and therefore helped identify priorities for the Seattle Round of WTO negotiations in late 1999. The report was featured in a U.S. press packet distributed at Seattle, and was requested by the House Agriculture Committee to prepare its members for the Seattle Ministerial. *An Introduction to State Trading in Agriculture* provides a qualitative index of the potential for a state trading organization to restrict trade, a potentially important WTO issue. *A Framework for Analyzing Technicr! Trade Barriers in Agricultural Markets* offered a classification scheme for assessing the economic impacts of technical trade barriers, such as sanitary and phytosanitary measures. ERS provided leadership for an international research effort to develop a trade policy database that will provide valuable data for negotiators and trade analysts. During 1999, results from ERS's WTO Issues research program were used by the Congress, the United States Trade Representative (USTR), and senior trade policy staff at USDA in support of the U.S. negotiating position.

The Economic Impacts of NAFTA. ERS completed a report on the effects of the North American Free Trade Agreement (NAFTA) on U.S. agriculture and the rural economy for submission to the United States Congress

in accordance with the NAFTA Implementation Act. The report indicates that, as NAFTA begins its sixth year, the agreement is having an important impact on the three partner countries. These effects are most apparent in increased agricultural trade volumes and expanded investment flow in production and food processing within North America. NAFTA-induced structural changes take time to work through the economy, so the complete effects of NAFTA will not be felt until the agreement is fully implemented and markets have adjusted to the new trade environment.

Goal 2: The food production system is safe and secure.

Objective: Enhanced understanding by policy makers, regulators, program managers, and those shaping public debate of economic issues involved in improving the efficiency, efficacy, and equity of public policies and programs designed to protect consumers from unsafe food.

Current Activities: To support the goal of a safe, secure food system, ERS analyzes the benefits of safer food and the costs of food safety policies. This research helps Government officials design more efficient and cost-effective approaches to food safety. ERS continues to study the costs of foodborne illnesses and the benefits of improving food safety. ERS staff are conducting research on measuring food safety benefits, alternative approaches to placing a value on premature death from foodborne disease in cost/benefit analyses, the costs of food safety regulations to food processors, and consumer attitudes and preferences towards food safety and safe food preparation practices. ERS is also actively collaborating with partner agencies in the National Food Safety Initiative. An example is a study of approaches to ranking food safety risks on the basis of economic costs to assist the Risk Assessment Consortium in its efforts to prioritize food safety risks. ERS is also working with economists from the Centers for Disease Control and Prevention, the Food and Drug Administration, and the Environmental Protection Agency to plan a conference for July 2000 on valuing mortality in cost/benefit analysis.

Selected Examples of Recent Progress:

User Fees to Finance Meat Inspection. USDA's Food Safety and Inspection Service finances about 13.5 percent of its FY 1996 budget outlays through user fees for overtime and unscheduled meat and poultry inspections. In *User-Fee Financing of USDA's Meat and Poultry Inspection*, ERS surveyed the application of user fees for financing meat and poultry inspection programs in other countries; reviewed user-fee systems in other Federal agencies, particularly those with food and agricultural missions or regulatory responsibilities; and discussed the relevant economics literature on the use and design of user fees. ERS suggested several elements that should underlie the structure of user fees for meat and poultry inspection, should such a program be introduced. The study suggests that agencies can better balance revenues and expenses through time if fees are based on costs. Cost-based fees promote more efficient use of agency resources and may limit political gaming by regulated firms. Agencies need to design ways to adjust fee schedules to account for inflation, productivity growth and changing workloads and must allow for reserve funds because revenues may not match expenditures throughout the year.

Costs of Foodborne Disease Updated. ERS used data provided by the Centers for Disease Control (CDC) from the "FoodNet" active surveillance system to update estimates of the costs of foodborne disease caused by four major microbial pathogens (estimated at $9.2 to $10.2 billion annually), and collaborated with CDC staff to refine and update the methodology for measuring the cost of foodborne disease. ERS published the new estimates of the costs associated with *Salmonella*-related illnesses in the May-August 1999 issue of *FoodReview* magazine. That issue, devoted to food safety, also contained articles discussing new food safety policies, the costs and benefits of pathogen reduction, new technologies to improve food safety, and food irradiation.

Competitive Agreements Program for Food Safety Research. The FY 1999 USDA Appropriations Act provided ERS with $453,000 to establish a competitive agreements program for food safety research. ERS announced the program nationwide soliciting proposals for annual funding levels between $100,000 and $200,000 for 3 years, with the overall duration not to exceed 5 years. Two grants were awarded, to Harvard University and the University of Wyoming, to begin a multi-year effort to apply state-of-the-art economic analysis to develop national estimates of the benefits of improving the safety of the Nation's food supply.

Goal 3: The nation's population is healthy and well-nourished.

Objective: Enhanced understanding by policy makers, regulators, program managers, and organizations shaping public debate of the factors affecting food prices and of the efficiency and effectiveness of alternative public policies and programs aimed at ensuring consumers equitable access to wide varieties of high quality food at affordable prices.

Current Activities: Beginning in FY 1998, ERS was given responsibility for conducting studies and evaluations of the Nation's domestic food and nutrition assistance programs, including the Food Stamp Program, the Supplemental Nutrition Program for Women, Infants, and Children (WIC), and Child Nutrition Programs. In response, ERS established the Food Assistance and Nutrition Research Program (FANRP). For FY 2000, Congress provided $11.195 million to ERS for conducting studies and evaluations of the Nation's domestic food and nutrition assistance programs. FANRP uses these funds to support a portfolio of extramural research designed to meet the needs of policy officials, program managers, the research community, and the public.

Intramural research at ERS also contributes to FANRP. ERS is in the process of establishing its research program for FY 2000. This process is launched with a National priority setting conference where Federal policy officials both within and outside USDA, Congressional staff, public and private sector researchers, and representatives from public interest groups identify research priorities. In 1999, discussions were organized around four themes: food program access and the working poor, food program dynamics and client well-being, improving outcomes of nutrition programs, and child nutrition research needs. Research priorities will be finalized and announcements of competitive contracts, grants, and research agreements will be made in the spring of 2000.

Selected Examples of Recent Progress:

Food Assistance and Nutrition Research Program. In FY 1999, Congress provided $10.195 million to ERS for conducting studies and evaluations of the Nation's domestic food and nutrition assistance programs. FANRP adopted Food Stamp caseload decline as one of its highest research priorities, responding to the interest that policymakers expressed about the recent unexpectedly large drop in food stamp participation. Another major new topic was better serving the working poor, recognizing that with an increasing policy emphasis on work and personal responsibility, assistance programs of all types are evolving to provide improved support for the working poor. A nutritional and health outcomes and dietary behavior theme was also added to reflect the emerging concern about the role of behavioral influences on nutrition and health. Ongoing ERS work includes new projects on food security at the individual and community level. Program integrity and effectiveness and enhanced food assistance research data continue as major themes for the program. ERS continued its small grants program at the Southern Rural Development Center, Mississippi and Alcorn State Universities; the American Indian Studies Program, University of Arizona; Institute for Research on Poverty, University of Wisconsin; Joint Center for Poverty Research, University of Chicago and Northwestern University; and Department of Nutrition, University of California at Davis. In FY 1999, 47 percent of the funds were awarded as contracts, 14 percent as grants, 14 percent as cooperative agreements, 8 percent as small grants, and 17 percent as interagency agreements. The FY 1999 program is discussed in more detail in *Food Assistance and Nutrition Research Program: Final Report of Fiscal 1999 Activities.*

Food Security in U.S. Households. ERS helped develop a Federal food security measure and now conducts an annual survey specifically designed to measure the prevalence of household food insecurity and hunger in the United States. In 1999 ERS released two studies examining household food security, both of which examined whether households always have access to enough food to meet basic needs. *Household Food Insecurity in the United States: 1995-1998* provides evidence that most households in the U.S. are food secure, but, during the period 1996-98, some 10 million U.S. households (9.7 percent of total) were food insecure. *Prevalence of Food Insecurity and Hunger, by State, 1996-98*, indicated the prevalence of food insecurity and hunger varied considerably among the States. Eleven States, located in an arc along the western and southern borders of the country, and the District of Columbia, had rates of food insecurity significantly above the national average.

Diet and Nutrition. Two ERS studies released in 1999 examine the implications of America's changing diet on health and farmers. *America's Eating Habits: Changes and Consequences* provides different perspectives on nutrition in the U.S. Topics covered include: the economic costs associated with unhealthy eating; how much people know about nutrition; how national income and prices and demographic trends affect nutrient intake; and how Government programs and regulations influence food expenditures and consumption. *Moving Toward the Food Guide Pyramid: Implications for U.S. Agriculture* discusses the implications for farmers if consumers followed eating recommendations provided by the USDA's Food Guide Pyramid. Specifically, the study examines what would happen to farm production, trade, and prices if consumers reduced their consumption of caloric sweeteners, fats, and oils and increased consumption of dark-green leafy and deep-yellow vegetables, and dry beans, peas, and lentils.

Family Child Care Homes. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 established a two-tier structure for meal reimbursement rates for family child care homes participating in the USDA's Child and Adult Care Food Program (CACFP). Homes located in low-income areas or operated by persons with incomes below 185 percent of the Federal poverty guidelines are designated as Tier 1. Meal reimbursement rates for Tier 1 homes, averaging $321 per month in FY 1998, are comparable to the rates that existed for all CACFP homes before the 1996 Act. Family child care homes that do not meet the low-income criteria are designated as Tier 2. They have lower reimbursement rates, averaging $173 per month in FY 1998. However, they can be reimbursed at Tier 1 rates for meals served to children from families with income below 185 percent of the poverty guideline. The Act also mandated a study of the effects of that change on program participation and state licensing of child care homes. ERS released the first report from this study, *Family Child Care Homes and the CACFP: Participation After Reimbursement*, prepared by Abt Associates. The report finds that participation in CACFP by child care homes dropped 6 percent and the number of sponsoring organizations that administer the participating child care homes dropped 2 percent between 1997 and 1998. In contrast, the number of licensed child care homes increased by 3 percent during the period. The strong economy, increased Federal child care funding, and new state pre-school programs, among other shifts in the child care market, made this a dynamic period of change in employment and child care options. Final results of the study will be available in early 2001.

Impact of Minimum Wage on Food Prices. ERS used an input-output model to analyze the full-cost pass-through effects of a minimum wage increase on prices of the food and kindred products and food-service industries. These sectors employ a disproportionate share of minimum wage workers. In *The Impact of Minimum Wage Increases on Food and Kindred Product Prices: An Analysis of Price Pass-Through*, ERS analysis suggests that a $0.50 increase in the present minimum wage would increase food prices less than 1 percent for most of the 12 food and kindred products industries and 1 percent at eating and drinking places.

Impact of Away-From-Home Foods on Diet Quality. Americans are dining out more often than ever, boosting the amount spent at eating places from 26 percent of food expenditures in 1970 to 39 percent in 1996. In *Away-From-Home Foods Increasingly Important to Quality of American Diet*, ERS research showed that during the 1970-95 period, home foods significantly improved their nutritional quality, more so than away-

from-home foods. Away-from-home foods typically contained more of the nutrients overconsumed (fat and saturated fat) and less of the nutrients underconsumed (calcium, fiber, and iron) by Americans. Since the trend of eating out frequently is expected to continue, strategies to improve the American diet must address consumers' food choices when eating out.

Goal 4: Agriculture and the environment are in harmony.

Objective: Enhanced understanding by policy makers, regulators, program managers, and those shaping public debate of the economic issues involved in balancing long term sustainability goals with improved agricultural competitiveness and economic growth and of the effects of Federal farm, natural resource, and rural policies and programs on that balance.

Current Activities: ERS analyzes economic and environmental issues associated with emerging biotechnology adoption, global climate change and agriculture, agricultural water quality and waste management, conservation and environmental programs, integrated pest management (IPM) and management of other crop inputs, and interactions between trade and the environment. ERS continues to collect, analyze, and report on trends in resource conditions and use, technology adoption, and productivity.

ERS research provides ongoing support for USDA programs and interests relating to these issues. ERS participates in the United States/European Community Task Force on Biotechnology Research, leading in developing and disseminating data on adoption of and impacts from genetically modified organisms in crop production. A monograph reporting the data and analyses of yield, pesticide use, and cost and return impacts of adopting these varieties is in preparation. ERS provides analytic support to the USDA Global Change Office and the U.S. Government Climate Change Research Program (USGCRP), as well as conducting an independent economic research effort.

ERS supports development and implementation of USDA conservation and environmental policies, including 1996 FAIR Act conservation title programs: the Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), and Wetlands Reserve Program (WRP). ERS is currently analyzing procedures for assessing bids for the 20th CRP sign up in January 2000.

Selected Examples of Recent Progress:

Adopting Genetically Engineered Crops. The ERS/NASS Agricultural Resource Management Study (ARMS) is USDA's primary vehicle for collection of information on a broad range of issues about agricultural resource use and costs, farm sector financial conditions, and adoption of new technologies like genetically engineered seed. ERS was the first USDA agency to provide Government survey data on the extent of adoption of genetically engineered soybeans, cotton, and corn crops. Timely release of these data on the ERS website provided key information on the adoption of genetically engineered products and interpretation of their impacts on pesticide use, crop yields, and net returns. ERS followed up on these information releases with more comprehensive published reports, such as *Pest Management in U.S. Agriculture,* which provides information on both chemical and biological pest management practices.

Natural Resource Conservation Policies. ERS published three major reports this year analyzing aspects of USDA and other policies affecting agricultural resource conservation. These analyses summarize changes in implementing earlier legislation--the Farm Act conservation titles and the Clean Water Act--and will contribute to debate of conservation and environmental policies in future legislation. *Wetlands and Agriculture: Private Interests and Public Benefits* comprehensively reviewed Federal and State policies affecting agricultural use of wetlands in the context of the Nation's "no net loss" goal. *Economic Valuation of Environmental Benefits and the Targeting of Conservation Programs: The Case of the CRP* examined changes in procedures for accepting land into the Conservation Reserve Program and estimated economic

benefits from the improved targeting. *Green Technologies for a More Sustainable Agriculture* summarized the case for improving agricultural sustainability and examined the potential and limitations of "green" technologies in meeting that goal. An array of popular articles, briefings, releases on the ERS website, and presentations both substantiated the findings in these reports and disseminated them to a broader public policy audience.

Implementing USDA Conservation Programs. In FY99, ERS served as a member of an inter-agency USDA working group responsible for assessing producer offers to bid land into the Conservation Reserve Program (CRP). ERS analyses helped USDA improve the environmental performance of the CRP and related programs, while lowering their cost to U.S. taxpayers. ERS researchers participated in the interagency Conservation Reserve Enhancement Program (CREP) Team, which was awarded the "Hammer" Award of the National Partnership for Reinventing Government.

Water Quality and Manure Management Issues. In FY99, ERS worked with staff from other Government agencies, as well as scientists and stakeholders to increase their understanding of agricultural waste management and water quality issues. In June, ERS organized a workshop, *Agriculture and Coastal Resources: Issues in Measuring the Economic Dimensions of Problems and Policies*, in cooperation with the Farm Foundation. Resource economists, marine scientists, and stakeholders from the agricultural, fishing, and recreational communities discussed issues associated with widespread water quality problems in estuarine environments.

U.S. Trade and Environment Initiatives. ERS participated in meetings supporting the USTR preparations for WTO ministerial meetings in Geneva and Seattle. ERS presented analyses of potential environmental indicators on soil quality and biodiversity at meetings of the Organization for European Cooperation and Development Joint Working Party in York (United Kingdom) and Paris, and presented an analysis of trade impacts resulting from U.S. soil conservation policies. ERS organized a workshop with university and governmental economists in October 1998 to discuss collaborative research on land degradation, its effects on agricultural productivity, the ways in which productivity estimates might be incorporated in analyses of global food production and food security, and possible impacts on other global resource and environmental issues.

Analysis of Inputs for Crop Production. In support of USDA and EPA implementation of the Montreal Protocol and the U.S. Clean Air Act, ERS coordinated analyses of the economic impacts from using alternatives to methyl bromide as use of that pesticide is phased out. ERS published a synthesis of the economic studies as a feature article in *Agricultural Outlook*. In addition, ERS published a report entitled *Pest Management in U.S. Agriculture*. The publication provides the most comprehensive reporting available of U.S. pest management practices, including integrated pest management, in major field crops and selected fruits and vegetables. ERS coordinated studies of pesticide price differentials between the U.S. and Canada under cooperative agreements developed with North Carolina State University and the University of Guelph. The final report, *Pesticide Price Differentials Between Canada and the U.S.*, was presented in simultaneous U.S. and Canadian conferences for Congressional staffs, Northern tier Governors' staffs, and other Federal agencies including EPA, USTR, and GAO.

Goal 5: Enhanced economic opportunity and quality of life for rural Americans.

Objective: Enhanced understanding by policy makers, regulators, program managers, and organizations shaping public debate of economic issues affecting rural development and performance of all sizes of American farms.

Current Activities: ERS continues to monitor changing economic and demographic trends in rural America, with particular attention to the implications of these changes for the employment, education, income, and housing patterns of low-income rural populations. A multi-faceted research project focuses on the changing

geography of low-wage, low-skill jobs and workers in rural areas, factors affecting changes in the supply and demand of this work force, and the impact of Federal and State policies, particularly welfare reform, on employment and wage levels in rural labor markets. Agency researchers are also analyzing the role that technology adoption and innovation plays in the demand for skilled workers and training programs. A special series of articles is focusing on critical research and policy issues in the rural South, including those related to labor force supply and demand, human capital needs, health care, transportation, and housing.

ERS also is concerned with the effectiveness of Federal programs aiding rural residents and farm operators. The agency is organizing a research seminar on the rural implications of poverty, welfare reform, and food assistance programs to provide the basis for more informed policy judgments about the effects of changing Federal assistance programs on rural people and places. ERS is assessing the effectiveness of USDA's Rural Rental Housing Program and Single Family Direct Loan Housing Program for meeting the housing needs of low-income rural Americans. In response to concerns about aging farm operators and the paucity of beginning farmers, ERS is analyzing Federal credit and tax policies to assess their impact on the intergenerational transfer of farm assets. Deregulation of financial markets and devolution of many Federal programs to State and local governments have raised concerns that rural communities may have difficulty competing with their better financed urban counterparts. To address these concerns, ERS is studying changes in the lending industry to determine their impact on the cost and availability of credit in rural America, continuing examination of the geographic distribution of Federal spending, and attempting to analyze the impact that Federal loan programs have on the growth of local rural economies.

ERS research identifies, measures, and analyzes forces contributing to current farm structure and farm structural change, investigates the role and future of small farms, examines efficiency/size relationships in major U.S. farming subsectors, measures farm enterprise cost structure, level and distribution, quantifies farm diversification, and advances analytical tools for conducting farm structure and performance research and analysis.

Selected Examples of Recent Progress:

Rural Development. ERS's program in rural development reinforces the Department's interests in promoting economic opportunity and well being in rural communities. ERS published a series of studies, including: *Will Increased Highway Funding Help Rural Areas?, The Impact of Minimum Wage Increases on Food and Kindred Products Prices, Rural Competitiveness: Results of the 1996 Manufacturing Survey,* and *How Would Fundamental Tax Reform Affect Farmers?* Each study addresses the considerable challenges faced by rural communities related to profitable businesses, skilled workers, and infrastructure to support economic activity.

Impact of Natural Amenities in Rural Areas. Population change in rural counties over the last 25 years has been strongly related to their attractiveness as places to live. In *Natural Amenities Drive Population Change*, ERS presented a new natural amenities index which captures the attractiveness of mild climate, varied topography, and proximity to surface water. High-scoring counties tended to double their population, while the average gain for low-scoring counties was only one percent, and over half lost population. Population growth is typically associated with employment growth and increased local economic activity. The rural West has led the amenity-based rebound in population growth. In the April 1999 issue of *Rural Development Perspectives*, demographers pointed out that the rural West added over 1 million people during 1990-97, a 15 percent gain, compared with just over 5 percent for other rural areas. Yet, this is an environmentally sensitive region and some resources, such as water, are limited. Newcomers compete with traditional users for access to these resources. Environmental concerns heighten the demand for cooperative public and private initiatives as small communities across the region struggle to maintain a high quality of life in the face of rapid demographic change.

Additionally, in cooperation with the Farm Foundation, ERS organized a workshop entitled *Rural Land Use: Public Preferences for Open Space and Implications for Policy Design*, on the visual, aesthetic, recreational and environmental amenities provided by agricultural land. The workshop led to successful collaboration with university researchers for National Research Initiative funding to identify and value amenities and draw out implications for policy design. Working with FAS, ERS developed a white paper on multifunctionality in agriculture to inform U.S. WTO negotiators and representatives to OECD committees.

Farm Structure and Small Farms. ERS developed and widely disseminated a new farm typology that links sales, occupation, and lifestyle characteristics, as well as a new geographic characterization for agriculture that supports analyses of small or disadvantaged farms, minority farmers, and the impacts of market and natural events. ERS published the *20th Annual Family Farm Report to Congress* and highlighted the work of the Secretary's National Commission on Small Farms in a major ERS-organized conference on "What Makes a Small Farm Successful."

Socioeconomic Status of Rural Minorities. As the decade of the 1990's closes, nearly all of the main economic indicators used to examine differences in socioeconomic status and well-being continue to show wide gaps in the levels of poverty, unemployment, earnings, and income sources between rural minorities and whites. In the February 1999 issue of *Rural Conditions and Trends*, ERS identified 333 rural counties where minorities constitute at least one-third of the population. While these counties contain only 12 percent of the total nonmetro population, they account for 45 percent of rural minorities. As part of the overall rural rebound during the 1990's, minority counties shared in higher rates of population growth and net immigration. However, the economic benefits usually associated with population growth were less evident in minority counties. Unemployment levels remain higher in minority counties and per capita income remains below the nonmetro average. This economic disadvantage tends to be more pronounced in counties where the minority group constitutes a majority of the population. And their economic future is uncertain. For example, predominantly Black counties in which manufacturing has been an important source of jobs are now finding it difficult to compete in the face of new technology and the demand for more highly skilled workers.

Survey of Participants in the USDA Housing Program. ERS conducted the first nationally representative sample survey of participants in USDA's Section 502 housing program. The survey found that, compared to other groups of low-income rural borrowers, those served by Section 502 include larger than proportionate shares of young borrowers under the age of 40, single-parent households, and young married couples with children. It also found that disproportionate shares of Hispanics and Blacks participate in the program. Responses also indicated that, without the Section 502 program, 90 percent of borrowers thought it would have taken longer than 2 years for them to be able to buy a comparable home, if they ever could have done so.

NATIONAL AGRICULTURAL STATISTICS SERVICE

Purpose Statement

The National Agricultural Statistics Service (NASS) administers the United States Department of Agriculture's (USDA) program of collecting and publishing current national, State, and county agricultural statistics. The mission of NASS is to serve the basic agricultural and rural data needs of the people of the United States, those working in agriculture, and those living in rural communities by objectively providing important, usable, and accurate statistical information and services needed to make informed decisions.

The statistical data provided by NASS are essential to both the public and private sectors for making effective policy, production, and marketing decisions on a wide range of agricultural commodities. Every 5 years the census of agriculture provides comprehensive national, State, and county data as well as selected data for Puerto Rico, Guam, Virgin Islands, American Samoa, and Northern Mariana Islands. USDA published its first crop report in 1863, and further strengthened this responsibility in 1905 by creating the Crop Reporting Board, now the Agricultural Statistics Board, and by receiving responsibility, beginning in fiscal year 1997, for conducting the census of agriculture, previously conducted by the Bureau of the Census, Department of Commerce. NASS's responsibilities are authorized under the Agricultural Marketing Act of 1946 (7 U.S.C. 1621-1627) and the Census of Agriculture Act of 1997, Public Law 105-113 (7 U.S.C. 2204g).

NASS's statistics keep those involved with America's biggest industry well informed, help provide the basic information necessary to keep agricultural markets stable and efficient, and help maintain a "level playing field" for users of agricultural statistics. The census of agriculture provides comprehensive data about agricultural communities across the nation and is the only source of comprehensive county level data which are useful for measuring changes at the local level.

NASS programs are conducted in the following four major areas:

1. Agricultural Estimates. NASS State Statistical Offices regularly survey thousands of operators of farms, ranches, and agribusinesses who provide information on a confidential basis. These scientifically designed surveys provide the basis for developing estimates of production, supply, price, and other aspects of the agricultural economy. Official USDA national, State, and county estimates and reports are issued relating to number of farms and land in farms; acreage, types and production of farm crops; number of livestock on farms and of livestock products, stocks of agricultural commodities, value and utilization of farm products, farm labor, prices received and paid by farmers, agricultural chemical use, and on other subjects as needed. The State Offices forward the estimates to NASS headquarters where they are combined and released at scheduled times to the press and public through the Agricultural Statistics Board. Annually, NASS publishes over 400 national reports which cover more than 120 crop and 45 livestock items, and which are complemented by additional State reports. These basic and unbiased data are necessary to maintain an orderly association between the consumption, supply, marketing, and input sectors of agriculture.

2. Statistical Research and Service. Research is conducted to improve the statistical methods and related technologies used in developing U.S. agricultural statistics. The highest priority of the research agenda is to aid the NASS estimation program through development of better estimators at lower cost and with less respondent burden. This means greater efficiency in sampling and data collection coupled with higher quality data upon which to base the official estimates. In addition, new products for data users are being developed with the use of technologies such as remote

sensing and geographic information systems. Continued service to users will be increasingly dependent upon methodological and technological efficiencies.

3. Census of Agriculture. The census of agriculture is taken every 5 years and provides comprehensive data on the agricultural economy including: data on the number of farms, land use, production expenses, value of land and buildings, farm size and characteristics of farm operators, market value of agricultural production sold, acreage of major crops, inventory of livestock and poultry, and farm irrigation practices. Results of the 1997 Census of Agriculture, released in February 1999, provide national, State, and county level detailed data. Data for Puerto Rico, Guam, the Virgin Islands, and the Northern Mariana Islands were released later in 1999. The next census of agriculture will be conducted beginning in January 2003 for the calendar year 2002.

4. Work Performed for Others. NASS conducts surveys for and lends technical expertise to other Federal agencies, State governments, and private organizations on a reimbursable basis. NASS provides support and assistance in the areas of questionnaire and sample design, data collection and editing, analysis of survey results, and training. NASS also provides technical consultation, support, and assistance for international programs under participating agency service agreements.

The National Agricultural Statistics Service maintains a central office in Washington, D.C., and a network of 45 field offices, serving all 50 States, that operate through cooperative agreements with State Departments of Agriculture or universities. As of September 30, 1999, NASS had 1,102 permanent full-time employees, including 424 full-time employees in Washington, D.C., 677 in field offices, and 1 in U.S. territories and foreign countries.

NATIONAL AGRICULTURAL STATISTICS SERVICE

Available Funds and Staff Years

1999 Actual and Estimated 2000 and 2001

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
National Agricultural Statistics Service	$103,964,000	1,029	$ 99,333,000	1,029	$100,615,000	1,027
Carryover	22,623	--	461,839	--	--	--
Obligations under other USDA appropriations:						
Agricultural Marketing Service for pesticide work, and data on milk prices, livestock and grain news, and base month series	316,500	4	280,500	3	280,500	3
Agricultural Research Service for assistance on food consumption data, Nutrient Data Laboratory, and USDA/ OPM DEMO Project	140,800	2	20,000	--	20,000	--
Animal and Plant Health Inspection Service for animal health monitoring system, and fruit and wildlife damage survey	500,000	6	520,000	6	520,000	6
Cooperative State Research, Education, and Extension Service for HACU liaison	164,000	2	--	--	--	--
Economic Research Service for an agricultural resource management and agricultural structure studies	3,970,813	43	4,219,000	47	4,219,000	47
Farm Service Agency for data on feed grain county cash flow model	140,000	2	140,000	2	140,000	2
Food Safety and Inspection Service for livestock inspection	--	--	60,000	1	60,000	1

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Forest Service for data on grazing fees	47,000	--	47,000	--	47,000	--
Natural Resources Conservation: Service for a census data lab and T & A development	200,000	2	--	--	--	--
Risk Management Agency for data on county estimates	675,000	8	675,000	8	675,000	8
Rural Development for loan program consulting	28,000	--	30,000	--	30,000	--
World Agricultural Outlook Board for printing and lock-up support	4,468	--	5,000	--	5,000	--
Total, Other USDA Appropriations	6,186,581	69	5,996,500	67	5,996,500	67
Total, USDA Appropriations	110,173,204	1,098	105,791,339	1,096	106,611,500	1,094
Other Federal Funds:						
Environmental Protection Agency for special tabulations	4,000	--	25,000	--	25,000	--
Interior, Department of, for BLM grazing fees survey and Census of Agriculture in American Samoa during 1999	93,500	--	43,500	--	43,500	--
Foreign Agricultural Service (From AID) for training, technical assistance, equipment and personnel detail	659,800	6	900,000	8	900,000	8
National Science Foundation for data collection	20,000	--	--	--	--	--
National Institute for Occupational Safety and Health for a childhood agriculture injury survey	750,000	8	721,000	8	721,000	8
Total, Other Federal Funds	1,527,300	14	1,689,500	16	1,689,500	16

Item	1999 Actual		2000 Estimated		2001 Estimated	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Non-Federal Funds:						
State Agencies for survey work	2,127,477	24	2,114,000	24	2,114,000	24
Miscellaneous Contributed Funds for distribution of agricultural reports and diskettes and for data on almonds, cherries, hops, malting barley, potato pesticides, walnuts, wheat, and miscellaneous mailings	263,752	1	300,000	1	300,000	1
Total, Non-Federal Funds	2,391,229	25	2,414,000	25	2,414,000	25
Total, National Agricultural Statistics Service	114,091,733	1,137	109,894,839	1,137	110,715,000	1,135

NATIONAL AGRICULTURAL STATISTICS SERVICE

Permanent Positions by Grade and Staff Year Summary

1999 Actual and Estimated 2000 and 2001

Grade	1999 Wash. DC	1999 Field	1999 Total	2000 Wash. DC	2000 Field	2000 Total	2001 Wash. DC	2001 Field	2001 Total
ES-6	1	--	1	--	--	--	--	--	--
ES-5	3	--	3	3	--	3	3	--	3
ES-4	2	--	2	2	--	2	3	--	3
ES-3	1	--	1	1	--	1	--	--	--
ES-2	1	--	1	--	--	--	4	--	4
ES-1	--	--	--	4	--	4	--	--	--
GS-15	18	16	34	16	16	32	16	16	32
GS-14	56	45	101	56	45	101	57	45	102
GS-13	181	65	246	178	64	242	180	64	244
GS-12	39	141	180	37	139	176	37	138	175
GS-11	14	73	87	14	72	86	14	71	85
GS-10	7	--	7	7	--	7	7	--	7
GS-9	16	44	60	16	43	59	16	43	59
GS-8	32	13	45	31	13	44	31	13	44
GS-7	24	105	129	24	104	128	24	103	127
GS-6	16	106	122	16	105	121	16	104	120
GS-5	11	49	60	11	48	59	11	47	58
GS-4	5	31	36	5	31	36	5	31	36
GS-3	--	1	1	--	1	1	--	1	1
Total Permanent Positions	427	689	1,116	421	681	1,102	424	676	1,100
Unfilled Positions end-of-year	3	11	14	--	--	--	--	--	--
Total, Permanent Full-time Employment, end of-year	424	678	1,102	421	681	1,102	424	676	1,100
Staff Year Ceiling	445	692	1,137	442	695	1,137	445	690	1,135

NATIONAL AGRICULTURAL STATISTICS SERVICE

CLASSIFICATION BY OBJECTS
1999 Actual and Estimated 2000 and 2001

	1999	2000	2001
Personnel Compensation:			
Washington, DC	$25,182,231	$26,104,000	$27,322,000
Field	26,084,526	27,406,000	28,301,000
11 Total personnel compensation	51,266,757	53,510,000	55,623,000
12 Personnel benefits	11,714,592	12,227,000	12,709,000
13 Benefits for former personnel	11,959	12,000	12,000
Total personnel compensation and benefits	62,993,308	65,749,000	68,344,000
Other Objects:			
21 Travel	1,927,460	1,778,000	1,653,000
22 Transportation of things	504,803	821,000	763,000
23.2 Rental payments to others	220,615	221,000	221,000
23.3 Communications, utilities, and miscellaneous charges	3,063,409	3,488,000	3,191,000
24 Printing and reproduction	948,607	560,000	520,000
25.1 Advisory and assistance services	335,641	197,000	262,000
25.2 Other services	21,336,141	15,903,839	14,349,000
25.3 Purchase of goods and services from Government accounts	6,626,225	5,993,000	5,527,000
25.4 Operation and maintenance facilities	111,943	80,000	71,000
25.5 Research and development contracts	233,000	315,000	315,000
25.7 Operation and maintenance of equipment	1,327,200	949,000	838,000
26 Supplies and materials	1,220,756	1,140,000	1,717,000
31 Equipment	2,610,624	2,599,000	2,843,000
42 Insurance claims & indemnities	2,704	1,000	1,000
43 Interest and dividends	991	--	--
Total other objects	40,470,605	34,045,839	32,271,000
Total direct obligations	103,463,913	99,794,839	100,615,000
Position Data:			
Average salary, ES positions	$123,968	$124,107	$128,517
Average salary, GS positions	$50,302	$52,663	$54,847
Average grade, GS positions	10.2	10.2	10.2

NATIONAL AGRICULTURAL STATISTICS SERVICE

PASSENGER MOTOR VEHICLES

The 2001 Budget Estimates propose the purchase of one additional motor vehicle and the replacement of two passenger motor vehicles.

The passenger motor vehicles of the National Agricultural Statistics Service are used (where common carriers or GSA vehicles are not feasible) for necessary field travel in carrying out the mission of the Agency. All passenger motor vehicles are located at various field offices.

Additional passenger motor vehicles. The one additional passenger motor vehicle is for the Colorado field office. GSA has gradually closed many of its motor pool facilities making it more difficult for NASS personnel to obtain cars when needed. The use of common carriers is not feasible in carrying out the program of NASS.

Replacement of passenger motor vehicles. Replacement of two of the three vehicles now in operation is proposed. These three vehicles are located in three field office locations and are necessary to meet the transportation requirements inherent in carrying out the Agency's program. The vehicles proposed to be replaced will have passed the minimum replacement standards of 6 years of age or 60,000 miles prescribed by the General Services Administration.

Age and mileage data for motor vehicles on hand as of September 30, 1999, are as follows:

Age Data			Mileage Data		
Age-Year Model	Number of Vehicles	Percent of Total	Lifetime Mileage (thousands)	Number of Vehicles	Percent of Total
1991 or older	1	33%	80-100	0	0%
1992	0	0%	60-80	1	33%
1995	1	33%	40-60	1	33%
1996	1	33%	20-40	1	33%
Total	3	100%	Total	3	100%

NATIONAL AGRICULTURAL STATISTICS SERVICE

The estimates include appropriation language for this item as follows (new language underscored; deleted matter enclosed in brackets):

For necessary expenses of the National Agricultural Statistics Service in conducting statistical reporting and service work, including crop and livestock estimates, statistical coordination and improvements, marketing surveys, and the Census of Agriculture, as authorized by the Agricultural Marketing Act of 1946 (7 U.S.C. 1621-1627), the Census of Agriculture Act of 1997, Public Law 105-113, and other laws, [$99,405,000] $100,615,000, of which up to [$16,490,000] $15,000,000 shall be available until expended for the Census of Agriculture: *Provided*, That this appropriation shall be available for employment pursuant to the second sentence of section 706(a) of the Organic Act of 1944 (7 U.S.C. 2225), and not to exceed $40,000 shall be available for employment under 5 U.S.C. 3109.

NATIONAL AGRICULTURAL STATISTICS SERVICE

SALARIES AND EXPENSES

Appropriations Act, 2000	$ 99,405,000
Budget Estimate, 2001	100,615,000
Net Increase in Appropriation	+1,210,000

Adjustments in 2000:		
Appropriations Act, 2000	$99,405,000	
Rescission under P.L. 106-113	-72,000	
Adjusted base for 2000		99,333,000
Budget Estimate, 2001		100,615,000
Increase over adjusted 2000		+1,282,000

SUMMARY OF INCREASES AND DECREASES
(On basis of adjusted appropriation)

Item of Change	2000 Estimated	Program Changes	2001 Estimated
Expanded Pesticide Use Surveys	$2,400,000	+$800,000	$3,200,000
Monthly Hog Survey	3,428,000	+572,000	4,000,000
Computer Security Architecture	200,000	+1,400,000	1,600,000
Census of Agriculture	14,590,000	+410,000	15,000,000
Agricultural Economics and Land Ownership Survey	1,900,000	-1,900,000	--
Subtotal, Census of Agriculture	16,490,000	-1,490,000	15,000,000
All Other	76,815,000	--	76,815,000
Total Available	99,333,000	+1,282,000	100,615,000

PROJECT STATEMENT
(On basis of adjusted appropriation)

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
1. Agricultural Estimates	$76,731,087	860	$78,987,000 a/	883	+$2,772,000 (1)	$81,759,000	893
2. Statistical Research & Service	3,573,042	36	3,856,000	36	--	3,856,000	36
3. Census of Agriculture	23,599,000	133	16,490,000	110	-1,490,000 (2)	15,000,000	98
Unobligated balance	60,871	--	--	--	--	--	--
Total, available or estimate	103,964,000	1,029	99,333,000	1,029	+1,282,000	100,615,000	1,027
2000 Rescission	--	--	+72,000	--			
Total, Appropriation	103,964,000	1,029	99,405,000	1,029			

a/ Reflects a rescission of $72,000 due to P.L. 106-113.

PROJECT STATEMENT
(On basis of availability)

Project	1999 Actual Amount	1999 Actual Staff Years	2000 Estimated Amount	2000 Estimated Staff Years	Increase or Decrease	2001 Estimated Amount	2001 Estimated Staff Years
1. Agricultural Estimates	$76,731,087	860	$78,987,000 a/	883	+$2,772,000 (1)	$81,759,000	893
2. Statistical Research & Service	3,573,042	36	3,856,000	36	--	3,856,000	36
3. Census of Agriculture	23,159,784	133	16,951,839	110	-1,951,839 (2)	15,000,000	98
Unobligated balance lapsing	60,871	--	--	--	--	--	--
Unobligated balance forward to next year	461,839	--	--	--	--	--	--
Total available or estimate	103,986,623	1,029	99,794,839	1,029	+ 820,161	100,615,000	1,027
Unobligated balance forward from prior years	-22,623	--	-461,839	--			
2000 Rescission	--	--	+72,000	--			
Total, Appropriation	103,964,000	1,029	99,405,000	1,029			

a/ Reflects a rescission of $72,000 due to P.L. 106-113.

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Justification of Increases and Decreases

(1) An increase of $2,772,000 for agricultural estimates ($78,987,000 available in 2000) consisting of:

(a) An increase of $1,400,000 and 2 staff-years for development of NASS Computer Security Architecture ($200,000 available in 2000).

Cybersecurity has replaced year 2000 issues as a top priority within the information technology community. There is a growing need for cybersecurity given the increased incidences of hacking into Government computers and associated threats of the loss, misuse, unauthorized access to, or modification of information on those computer systems. The level of sophistication displayed by hackers and others supports the need for aggressive security reforms, such as the requirement for early warning detection systems to provide information about attacks, intrusions, and viruses. Information security is of vital importance to maintain NASS's credibility given the market sensitivity of the reports released to the public, as well as the confidential nature of the data collected by NASS from the Nation's farmers, ranchers, and agribusinesses. The integrity of all electronic information collected, produced, disseminated, and maintained by NASS is essential in order to ensure the future continued success of the Agency's agricultural statistics program which serves the Nation's agricultural industry.

NASS publications and data products are available to the public through the Internet as well as in hardcopy which has broadened NASS's exposure to malicious attacks. NASS is continuously looking to the Internet for additional opportunities to enhance information dissemination and to expand communications. Security issues that an Internet access policy needs to address are: who will have access, which types of systems may be connected to the network, what types of information may be transmitted via the connected network, what are the requirements for user authentication for Internet-connected systems, and what are the requirements for data collection activities via the Internet.

In 1998, Lockheed Martin conducted a risk assessment and recommended that NASS deploy firewalls, encryption devices, and other security options to protect data from compromise or modification due to attacks. These recommendations were consistent with the findings of a 1995 Office of Inspector General audit. NASS is taking a proactive approach to cybersecurity since the integrity of sensitive information must be ensured without exception.

This proposed initiative provides specific funding to establish a computer security architecture which simultaneously addresses the technical, managerial, and administrative issues associated with information security within NASS. This initiative provides NASS with a security architecture which produces the appearance of a private telecommunications network for the Agency while enabling NASS to participate in the optimization of telecommunication resources with other agencies in the U.S. Department of Agriculture (USDA). The incorporation of firewalls and switches would provide the illusion of nonexistence of the NASS Wide Area Network to entities outside of the Agency. At the same time, the Agency would retain the benefits of a shared network by having the proper security systems in place to allow participation in USDA's Telecommunications Enterprise Network. Encryption provides additional security if hackers were to gain access to a NASS telecommunications link.

The intrusion detection and monitoring software would allow the NASS security staff to review access attempts, create audit trails, and monitor system connections for validity. The planned software records users' activities which provides accountability for actions taken. System performance monitoring analyzes system performance logs in real time to look for availability problems, including active attacks, system and network slowdowns and crashes. Currently NASS does not have this capability. Administrative issues are addressed through this security architecture with the inclusion of the staff resources required to implement, monitor, and maintain adequate security. Under this proposed initiative, overall administration time associated with system access will be reduced for both the end users and security administrators.

This initiative supports the Research, Education, and Economics (REE) *Goal 6: Enhance Partner Institutions and Information Systems to Facilitate Achievement of the REE Goals*. This security initiative would provide hardware, software, and personnel for protection of Agency systems and information through the addition of security systems, improved technical monitoring capabilities, and more efficient administration of security operations.

(b) A net increase of $572,000 and 4 staff-years consisting of $1,272,000 for the monthly hog survey and a decrease of $700,000 for the quarterly hog survey ($3,428,000 available in 2000).

The requested increase of $1,272,000 for implementation of a monthly hog survey program consists of $572,000 in additional funds and $700,000 redirected from the existing quarterly hog survey program.

Implementation of a monthly hog survey is specified in *Title IX-Livestock Mandatory Reporting, Subtitle C-Related Swine Reporting Provisions, Section 931. Improvement of Hogs and Pigs Inventory Report*, which passed as part of the fiscal year 2000 Agriculture Appropriations Bill in October 1999. This legislation states that the Secretary of Agriculture shall publish on a monthly basis the *Hogs and Pigs* inventory report which will provide more timely information on market supplies of pigs to facilitate more orderly marketing of hogs.

Currently NASS publishes a quarterly *Hogs and Pigs* report which provides inventory and breeding information for each of the 17 largest hog producing States, accounting for 92 percent of the total U.S. inventory, plus a combined total for all other States in order to provide data at the U.S.-level. Annually in December, NASS also publishes hog information, by State, for all States in the United States.

The proposed monthly survey would provide information on hog breeding herds and the future supply of pigs available for market in the eight non-quarterly intervening months. The monthly survey would focus on total breeding herd inventory, plus number of sows farrowed, pigs born, and number of sows bred the previous month, while the quarterly surveys would continue to collect information on total hog inventory and market hogs by weight groups, as well as breeding inventory. Restricting the collection of monthly information to breeding herd data provides the timely hog supply information requested by data users while at the same time omitting additional reporting burden on non-breeding hog operations.

This budget proposal permits NASS to append a monthly hog survey program to a quarterly hog survey program. Under this proposal, State-level totals would be provided on both a monthly and quarterly basis for fewer than 17 individual States but totals for all other States and the U.S. would continue to be provided. The exact number of States for which NASS could provide State-level data would need to be determined. Consistency would be maintained between the quarterly and monthly reports for comparability purposes.

In preparation for implementation of a monthly hog survey program in fiscal year 2001, NASS is doing some preliminary work in the areas of sample design, questionnaire development, and hog breeding herd industry analysis. This preliminary work would enable NASS to begin publishing monthly hog data as early as December 2000.

This initiative supports REE *Goal 1: Through Research and Education, Empower the Agricultural System With Knowledge that Will Improve Competitiveness in Domestic Production, Processing, and Marketing.* The monthly hog survey responds to the hog industry's need for more timely information on hog supplies in order to facilitate more orderly marketing of hogs.

(c) An increase of $800,000 and 4 staff-years for expansion of NASS's pesticide use statistics program ($2,400,000 available in 2000).

Section 1491 of the 1990 farm legislation mandated that USDA submit to Congress a comprehensive annual report concerning agricultural pesticide usage. This responsibility has been assigned to NASS, and a comprehensive report covering the major field crops, fruits, and vegetables produced in the United States has been published annually since 1991. Implementation of the Food Quality Protection Act (FQPA) in 1996 elevated interest in the availability of pesticide use statistics and heightened concerns regarding data gaps that exist in USDA program areas. FQPA and the data requirements of chemical risk assessments have reestablished the importance of having accurate chemical use data for an expanded number of commodities for use by the agricultural industry and for scientists tasked with evaluating pesticides, setting pesticide residue standards, and determining exposure risks. In order to accurately assess the impact of chemical use as directed by FQPA, the Environmental Protection Agency (EPA) and USDA, along with other agency and industry officials, have requested expansion of the NASS pesticide use data collection program. Additional funding is requested in order to expand the data collection program to cover additional States and commodities.

Additional funding in 1997 expanded the scope of the NASS survey program to include data series for postharvest chemical use applications, Integrated Pest Management practices, livestock chemical use, and general farm chemical use. In fiscal year 2000, NASS has expanded coverage of vegetable crops specifically identified as prevalent in the diets of infants and children under FQPA. The number of vegetable crops surveyed in the 2000 Vegetable Chemical Use Survey expanded to 42 from the 30 surveyed in 1998, while the number of States covered for vegetable crops increased from 14 to 19. In addition, in fiscal year 2000 preparatory work is underway for the Nursery and Greenhouse Survey to be conducted in fiscal year 2001 to collect information for the 2000 calendar year. These preparatory activities include development of sampling plans, conducting fact finding field interviews, testing of survey instruments, preparation of survey materials, and development of edit and summary programs. In addition to program changes related to funding increases, expansion of chemical use

surveys has occurred in order to address specific State or commodity issues. In the most recent Fruit Chemical Use Survey, data were collected for five additional nut crops, almonds, pecans, pistachios, walnuts, and hazelnuts, along with 25 fruit crops already in the program. Although significant progress has been made in increasing commodity coverage for chemical use statistics, data gaps still exist, particularly for field crops. The recommended increase of $800,000 for fiscal year 2001 would allow NASS to continue expansion of the current chemical use program to help address existing data gaps. Requested increases would allow incorporation of other field crops into the current survey rotation as is currently in place for the fruit and vegetable crops. Specifically, pesticide use surveys would be expanded to include data collection for the following field crops in fiscal year 2001: barley, dry beans, canola, flaxseed, hay, hops, lentils, mint, oats, rye, dry peas, sorghum, and sweet potatoes. Compiling the lists of commodities targeted for program expansion is a dynamic process since the lists are reviewed and updated annually based upon the current needs of data users, such as EPA and other USDA agencies, and others in the agricultural industry.

Providing pesticide usage data for agricultural commodities supports the *REE Goal 2: A Safe and Secure Food and Fiber System.* The NASS performance measure for this initiative is to provide documented evidence that pesticide use information is requested and used to make informed decisions by a wide cross-section of data users including farm worker groups, environmental organizations, corporations, universities, and other government agencies.

(2) A net decrease of $1,490,000 for Census of Agriculture ($16,490,000 in 2000) consisting of:

(a) An increase of $410,000 and 5 staff-years for the change in the census of agriculture cycle. This change reflects the cyclical changes in statistical activities associated with preparations for the 2002 Census of Agriculture ($14,590,000 available in 2000).

(b) A decrease of $1,900,000 and 17 staff-years for the Agricultural Economics and Land Ownership Survey ($1,900,000 available in 2000). This reduction reflects the removal of the Agricultural Economics and Land Ownership Survey, since it is to be conducted only once every 10 years following the alternating censuses of agriculture.

NATIONAL AGRICULTURAL STATISTICS SERVICE

GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF-YEARS

1999 Actual and Estimated 2000 and 2001

	1999		2000		2001	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Alabama	$1,140,380	12	$1,109,000	12	$1,093,000	12
Alaska	153,594	2	143,000	2	140,000	2
Arizona	751,683	9	846,000	10	832,000	10
Arkansas	1,377,799	15	1,337,000	15	1,330,000	15
California	3,231,582	27	3,512,000	28	3,557,000	28
Colorado	1,884,721	22	1,871,000	23	1,834,000	22
Delaware	86,083	1	81,000	1	79,000	1
District of Columbia	42,516,315	422	39,195,839	419	40,346,000	422
Florida	1,573,247	15	1,751,000	16	1,828,000	16
Georgia	1,428,803	14	1,494,000	14	1,502,000	14
Hawaii	512,046	8	481,000	8	478,000	8
Idaho	1,262,683	13	1,214,000	13	1,183,000	13
Illinois	1,918,512	16	1,817,000	16	1,821,000	16
Indiana	1,574,839	18	1,500,000	19	1,493,000	18
Iowa	1,918,345	18	1,876,000	19	1,863,000	19
Kansas	1,860,268	17	1,797,000	17	1,785,000	16
Kentucky	1,399,857	15	1,247,000	14	1,241,000	14
Louisiana	1,641,277	11	1,433,000	10	1,413,000	10
Maryland	1,027,830	13	958,000	12	941,000	12
Michigan	1,597,485	16	1,696,000	17	1,722,000	17
Minnesota	1,740,726	15	1,682,000	15	1,683,000	15
Mississippi	1,730,463	15	1,667,000	14	1,627,000	14
Missouri	2,264,035	16	2,608,000	16	2,600,000	15
Montana	996,162	12	950,000	12	927,000	12
Nebraska	1,636,115	14	1,568,000	14	1,529,000	14
Nevada	237,892	4	224,000	4	219,000	4
New Hampshire	1,159,882	15	1,079,000	15	1,085,000	15
New Jersey	1,006,543	12	1,082,000	12	1,077,000	12
New Mexico	656,365	7	616,000	7	601,000	7
New York	1,296,093	13	1,451,000	14	1,441,000	14
North Carolina	1,827,141	15	1,837,000	15	1,848,000	15
North Dakota	1,417,529	15	1,357,000	14	1,324,000	14
Ohio	1,450,826	15	1,383,000	15	1,407,000	15
Oklahoma	1,347,175	13	1,282,000	12	1,276,000	12
Oregon	1,227,335	13	1,219,000	13	1,204,000	13
Pennsylvania	1,127,265	14	1,155,000	14	1,173,000	14
South Carolina	857,543	11	863,000	11	847,000	11
South Dakota	1,601,176	16	1,566,000	16	1,556,000	16
Tennessee	1,221,488	14	1,143,000	13	1,120,000	13
Texas	3,559,356	25	3,556,000	26	3,511,000	26
Utah	672,403	9	631,000	9	615,000	9
Virginia	1,075,506	13	1,039,000	13	1,032,000	13

NATIONAL AGRICULTURAL STATISTICS SERVICE

GEOGRAPHIC BREAKDOWN OF OBLIGATIONS AND STAFF-YEARS

1999 Actual and Estimated 2000 and 2001

	1999		2000		2001	
	Amount	Staff Years	Amount	Staff Years	Amount	Staff Years
Washington.....	1,376,669	13	1,397,000	13	1,379,000	12
West Virginia..	613,605	8	583,000	8	569,000	8
Wisconsin.....	1,620,446	18	1,588,000	18	1,590,000	17
Wyoming.....	696,560	10	660,000	10	644,000	10
U.S. Territories	190,265	--	250,000	1	250,000	2
Subtotal, Available or Estimate.....	103,463,913	1,029	99,794,839	1,029	100,615,000	1,027
Unobligated Balance.....	522,710	--	--	--	--	--
Total, Available or Estimate....	103,986,623	1,029	99,794,839	1,029	100,615,000	1,027

NATIONAL AGRICULTURAL STATISTICS SERVICE

STATUS OF PROGRAM

The National Agricultural Statistics Service (NASS) administers the United States Department of Agriculture's (USDA) program of collecting and publishing current national, State, and county agricultural statistics. Also, in fiscal year 1997 NASS began conducting the census of agriculture, previously conducted by the Bureau of the Census, Department of Commerce. The census of agriculture, conducted every 5 years, provides comprehensive data about agricultural communities across the Nation and is the only source of comprehensive county level data which are useful for measuring changes at the local level. The statistical data provided by NASS are essential to both the public and private sectors for making effective policy, production, and marketing decisions on a wide range of agricultural commodities.

NASS programs are organized into the following four major areas: (1) agricultural estimates, (2) statistical research and service, (3) census of agriculture, and (4) work performed for others.

Current Activities:

1. Agricultural Estimates. The NASS agricultural statistics program is conducted through 45 field offices serving all 50 States. Scientifically designed surveys of farmers, ranchers, agribusinesses, and others provide the basis for developing estimates of production, supply, price, and many other aspects of the agricultural economy. These surveys are supplemented by field observations, objective yield counts and measurements, and other data to provide reliable information. Administrative data available from other USDA agencies and State Departments of Agriculture are also used to produce statistical reports. Examples of NASS reports using administrative data include the monthly reports of livestock and poultry slaughter and the production of egg and dairy products.

   Official USDA national, State, and county estimates and reports are issued relating to number of farms and land in farms; acreage, yield, production, and stocks of grains; production of hay, oilseeds, cotton, potatoes, tobacco, fruits, vegetables, floriculture, and selected specialty crops; inventories and production of hogs, cattle, sheep and wool, goats and mohair, mink, catfish, trout, poultry, eggs, and dairy products; prices received by farmers for products, prices paid for commodities and services, and related indexes; cold storage inventories; agricultural chemical use; and other related items that affect the agricultural economy. The NASS field offices forward the estimates to headquarters where they are combined and released at scheduled times to the media and public through published reports and for free on the Internet. Annually, NASS publishes over 400 national reports, which cover more than 120 crop and 45 livestock items and which are complemented by additional State reports. These basic and unbiased data are necessary to maintain an orderly association between the consumption, supply, marketing, and input sectors of agriculture.

2. Statistical Research and Service. Research is conducted to improve the statistical methods and related technologies used in developing U.S. agricultural statistics. The highest priority of the research agenda is to aid the NASS estimation program through development of better estimators at lower cost and with less respondent burden. This means greater efficiency in sampling and data collection coupled with higher quality data upon which to base the official estimates. In addition, new products for data users are being developed with the use of technologies such as remote sensing and geographic information systems. Continued service to users is increasingly dependent upon methodological and technological efficiencies.

3. Census of Agriculture. The census of agriculture is taken every 5 years and provides comprehensive data on the agricultural economy including: data on the number of farms, land use, production expenses, value of land and buildings, farm size and characteristics of farm operators, market value of agricultural production sold, acreage of major crops, inventory of livestock and poultry, and farm irrigation practices. Results of the 1997 Census of Agriculture, released in February 1999, provides detailed data at the national, State, and county levels. Data for Puerto Rico, Guam, the Virgin Islands, the Northern Mariana Islands, and American Samoa were released later in 1999.

4. Work Performed for Others. NASS conducts surveys for and lends technical expertise to other Federal agencies, State governments, and private organizations on a reimbursable basis. NASS provides support and assistance in the areas of questionnaire and sample design, data collection and editing, analysis of survey results, and training. NASS also provides technical consultation, support, and assistance for international programs under participating agency service agreements.

The NASS accomplishments and key activities in fiscal year 1999 are categorized below within the six goals of the Research, Education, and Economics (REE) mission area. These six goals are outlined in the 1997-2002 REE Strategic Plan and are also further developed in the strategic plans of the four agencies included in the REE mission area: the Agricultural Research Service (ARS), Cooperative State Research, Education, and Extension Service (CSREES), Economic Research Service (ERS), and NASS.

Selected Examples of Recent Progress: Recent accomplishments are cited below by each of the six REE Goals.

Goal 1: Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing to successfully compete in the global market.

AGRICULTURAL ESTIMATES

NASS provides timely and accurate agricultural statistics that are used throughout the agricultural sector to evaluate supplies and determine competitive prices for world marketing of U.S. commodities. These statistics promote a level playing field in production agriculture with impartial statistics available to all at a predetermined and publicized date and time.

Planted Acreage Update. Due to the unusually heavy rainfall received in the spring of 1999, many North Dakota operations had not completed planting at the time NASS conducted its large annual June survey which determines acres of crops planted for that year. Therefore, farm operators were recontacted in late July to verify planted acreage and harvest intentions. The updated planting data were published in the *Crop Production* report released on August 12, 1999.

Unharvested Production Updated. Because the 1999 harvest season was very late in Montana and North Dakota, producers reporting unharvested production during NASS's September survey were recontacted later in the fall to verify the final acreage harvested, along with the crop yield and production. The updated data were released in the November 10, 1999, *Crop Production* report.

Updated Florida's Grapefruit Production. Hurricane Irene caused considerable damage to crops in southern Florida, especially grapefruit. NASS conducted a special survey to measure the amount of fruit blown off the trees. The updated Florida grapefruit production data were published in the *Crop Production* report released on November 10, 1999.

U.S. and Canadian Cattle. A joint effort by Statistics Canada and NASS resulted in the first-ever combined United States and Canadian Cattle publication released on February 22, 1999. It contained the number of cattle and calves by class and calf crop for both countries within one publication. This information, which will be published annually, was requested by the U.S. cattle industry to provide producers with additional information about potential beef supplies.

Equine Report. NASS published its first equine release on March 2, 1999. The report included inventory data for horses, ponies, mules, burros, and donkeys, along with sales and cash receipts information.

Improvements to the Weekly Crop Progress Survey. Data are collected from respondents across the country for NASS's highly popular *Weekly Crop Progress* report. Interactive data collection was instituted in several States during fiscal year 1999 to streamline and accelerate the data collection process. Reporters now sign on to the Internet to receive the current week's questionnaire; after completion, the questionnaire is transmitted to each field office for summary, analysis, and publication. The information is very timely–data are collected on Monday morning and the report is released at 4 p.m. that same day from April through November.

Data Warehouse. NASS has developed an integrated, easy to use, high performance Data Warehouse System to provide easy internal access by employees to current and previous survey and census reporter-level data. The Data Warehouse currently contains over 600 million data records from the 1997 Census of Agriculture and over 80 surveys from 1997 through 1999. As NASS's survey and census systems are being integrated with the Data Warehouse, efficiencies and quality improvements are starting to be realized for NASS's sampling, survey management, data collection, data editing, data analysis and estimation processes due to the ready access of current and previous data.

Improved Data Collection and Editing. NASS has begun a conversion of its Computer Assisted Telephone Interviewing (CATI) and Interactive Editing (IE) processes to a new software version. This will allow our interviewers and editors to move from the outdated Disk Operating System (DOS) environment to a 32-bit Windows environment. In addition, the new software has additional features which will make the data collection and editing processes more efficient.

IE of NASS's large June Area Survey was expanded to all States in 1999, except for Texas. A new IE application for the Fall Area Survey is being implemented in 14 States, with plans to implement in all States in fiscal year 2000; this is the first time that IE will be used on a survey where complex chemical use data are being collected. IE is very advantageous since it provides field offices with immediate editing feedback, resulting in significant reductions in time spent on editing since manual handling of questionnaires is reduced and almost all errors are resolved in the initial attempt.

Improved Quality and Coverage of NASS List Frame. During fiscal year 1999, the new NASS record linkage system was used operationally to merge approximately 3.2 million records from the 1997 Census of Agriculture mail list with the existing NASS List Sampling Frame. From the merge, over 500,000 farms were added to the frame and almost 13 million transactions were generated to update agricultural data items on previously existing frame records. Coverage for major agricultural items increased 10-15 percent. The new record linkage system uses probabilistic record linkage methodology to identify duplication within a list or to identify duplicates across two or more separate lists; the nonduplicates can be added to the master list frame and control data information from one duplicate can be used to update old or missing data on the other duplicate. In the future, States will be able to use the system to continually improve their name and address lists by merging new list sources with their mail lists on a regular basis.

Implementation of New Sample Design for the Quarterly Crops/Stocks Survey. NASS implemented a new Multivariate Probability Proportional to Size (MPPS) sample design for the Quarterly Crops/Stocks Survey in 14 States. The new MPPS design will be implemented in the remaining States in fiscal year 2000. This design reduces respondent burden, lowers survey costs, better targets rare commodities which are usually the most difficult to measure, and is more flexible since targeted survey crops can be added and deleted more easily than under the old design. Initial results indicate that sample sizes can be reduced 5-10 percent, lowering survey costs with little loss of precision.

Customer Service. In conjunction with the release of the 1997 Census of Agriculture in February 1999, media kits with the 1997 census highlights and profiles, along with other pertinent information, were prepared and distributed at the census release day ceremony and mailed to waiting data users. Other successes include:

- Thousands of the popular NASS *Quick Facts* brochure containing information from the census were provided upon request to numerous agricultural organizations around the country. A supply of the brochures were also given to USDA's Office of Communications for distribution to outside groups and organizations coming into USDA for specific activities throughout the year.

- NASS staff accelerated ongoing public outreach efforts by attending an unprecedented number of conferences and seminars, setting up booths to distribute information and gather feedback on NASS products and services offered during 1999. Examples include: The Small Farms Conference; Future Farmers of America Convention; Irrigation Association Meeting; Farm Managers and Rural Appraisers; Sunbelt Ag Expo; and the National Association of Farm Broadcasters.

- The NASS toll-free hotline in Headquarters recorded over 5,000 calls for information and the main e-mail box for NASS customer inquiries received over 1,300 inquiries.

- A survey of subscribers to the USDA/Mann Library e-mail subscription report service was jointly developed by representatives from Mann, the Economic Research Service (ERS), NASS, and the World Agricultural Outlook Board (WAOB) to collect information on customer satisfaction and characteristics. The survey was sent via e-mail to about 5,000 subscribers in January 1999, with two followup mailings to nonrespondents in February. A total of 1,673 usable replies were tabulated, providing the following key findings:

  - A total of 45 percent of the respondents were from urban areas, 18 percent from small cities, and 15 percent from rural areas.
  - The most frequent workplace site category was school, college, or university.
  - A total of 78 percent of the respondents said they use the reports because they contain useful data; 73 percent because data are up-to-date.
  - E-mail delivery is used because the reports are delivered quickly (79 percent) or delivered automatically (78 percent).
  - A total of 80 percent of the respondents find the reports easy to read as displayed by their e-mail software.
  - More than 91 percent can receive attachments with their e-mail messages.
  - Some respondents desire to receive the reports in additional formats--spreadsheet was the most frequently noted choice.
  - More than 78 percent of the respondents do not wish to receive an announcement of the report rather than the report itself.
  - Comments showed a high level of satisfaction with the service.

- NASS worked with USDA's Office of Communications to develop a consolidated Agency release calendar for public access on the Internet. The combined release calendar for ERS, NASS, WAOB, and the Foreign Agricultural Service (FAS) is available from the USDA Home Page by selecting *News & Information*, then *Agency Reports/Schedule*.

Internet. The popularity of accessing information through Internet continued to grow in fiscal year 1999, providing readily accessible and timely information for data users. During a recent week, the USDA Web Server was accessed 3.1 million times, of which inquiries to NASS accounted for nearly 399,000 of those hits. The NASS crop and livestock reports were first in popularity among USDA agencies, with nearly 14,000 to 17,000 hits per week; this excludes the accesses to the NASS State publications, the Agricultural Census, Research Division reports, and the Mann Library server at Cornell University.

NASS staff worked with ERS, WAOB, and Cornell University to enhance the *Economics and Statistics System* Internet site at Cornell University. The Mann Library at Cornell University archives reports and provides an email subscription service for NASS, ERS and WAOB under a cooperative agreement. The new *USDA Economics and Statistics System* Home Page improves navigation from page-to-page and enhances USDA and the Agency's identities. The e-mail subscription process was upgraded to enable customers to click on the desired reports in order to subscribe or unsubscribe. E-mail subscriptions to NASS individual reports increased over 50 percent in the last year for most individual reports, and electronic subscriptions for all reports on the Economic Statistics System total over 42,000. The most popular reports are *Crop Progress* (1,711 subscribers); *Crop Production* (1,956 subscribers); *Grain Stocks* (1,354 subscribers); *Agricultural Prices* (1,652 subscribers); *Cattle* (1,288 subscribers); and *Hogs and Pigs* (979 subscribers).

NASS updated *NASS Kids*, a place on the Internet for young people to learn about agriculture, math, and statistics. A limited Spanish version was provided as well as lesson plans from the census of agriculture.

The Home Page for NASS's Research Division was completed, including the addition of graphics in the research output tables.

NASS also deployed an on-line database containing published crops, livestock, and price information that provides custom query options for customers. The on-line database has significantly reduced the number of special data requests; now customers are simply pointed to the NASS website. Data from many NASS reports are available including the *Crop Progress*, *Crop Production*, *Grain Stocks*, *Agricultural Prices*, *Cattle* and *Hogs and Pigs*. County level data are also available for major field crop and livestock commodities to meet local data needs. This popular site enables users to make special queries, then view the results on-screen or download for the customer's own purposes and software. The downloaded data are commonly used by analysts to populate computer data models to project future crop yields and other items under differing conditions.

STATISTICAL RESEARCH AND SERVICE

NASS conducts research to improve the statistical methods and techniques used to develop agricultural statistics.

AGGIES. An automated edit and imputation system, called the Agricultural Generalized Imputation Edit System (AGGIES), is being developed and evaluated. The system offers NASS several potential advantages over current editing procedures. First, the editing and imputation functions are fully automated, eliminating the need for the extensive manual data reviews currently done. Second, these functions are performed objectively allowing for more consistency throughout the editing process. Finally,

the system can be easily applied to any number of surveys, thereby conserving resources through the development and maintenance of a single system. Evaluations using data collected by surveys and censuses conducted by NASS have been completed by comparing AGGIES output to current processing output. National statistical organizations from Italy, Ireland, The Netherlands and the U.S. Bureau of the Census have requested copies of the AGGIES source code to evaluate for possible inclusion in their editing systems.

Respondent Relations. NASS has continued work on better understanding, analyzing, and responding to survey nonresponse concerns, with the ultimate goal of creating innovative data collection procedures to address specific issues. A training program designed to better prepare enumerators to handle reluctant producers and convert nonrespondents was developed and used to train supervisory interviewers from every field office, as well as groups of interviewers in selected States. Data were also collected from producers about their knowledge and attitudes of NASS's work and reports. This information will be used to guide development of new publicity materials. Information was also collected from a subgroup of respondents in the Agricultural Resource Management Study about ways to reduce the burden of reporting and possible alternative methods of data collection that respondents might prefer to survey interviews.

WORK PERFORMED FOR OTHERS

NASS performs services and statistical consultation for other Federal and State agencies and private commodity organizations on a reimbursable basis. Statistics generated meet special needs not covered by the national agricultural statistics program. In addition, statistical consultation by NASS staff members contributes to improvements in the overall quality and consistency of statistical information produced for the needs of other organizations.

Data Warehouse Consultation. NASS provided consultation to other government organizations in the expanding field of designing, developing, implementing, and managing Data Warehouse Systems to provide easy access to critical data within organizations. Government agencies NASS consulted with during 1999 include: Rural Development (RD), Animal and Plant Health Inspection Service (APHIS), Farm Service Agency (FSA), Food Safety and Inspection Service (FSIS), Natural Resources Conservation Service (NRCS), Office of the Chief Financial Officer, Office of the Chief Information Officer, the Department of Transportation's Bureau of Transportation Statistics and Office of Airline Information.

Consulting on Loan Subsidy Estimates. NASS continued statistical consulting services to the budget divisions of RD and FSA. The work addressed an Office of Inspector General audit that resulted in a deficiency finding in the prediction of loan rates for RD and FSA loans. Three NASS statisticians provided various services to FSA and RD during the year including: improving the cash flow models for direct and guaranteed loans, providing statistically defensible inputs to the models, and providing sensitivity analyses on the models.

Special State Surveys Conducted. In cooperation with State Departments of Agriculture, Land-Grant Colleges and Universities, and industry groups, NASS conducted 122 special surveys in fiscal year 1999, covering such varied issues as farm safety, pesticide use, county estimates, nursery/horticulture, farm finance, and specialty vegetable crops.

Special Surveys Conducted in FY 1999 by State Statistical Offices, by Survey Type:

	Number of Surveys
Seeds, Field Crops, Vegetables	18
Fruits & Nuts	21
County Estimates	12
Cropping Practices, Pest. Use	11
Livestock	7
Safety/Health, Disability	4
Nursery/Horticulture	2
Farm Finance, Land Values	14
Labor	2
Misc. - All other	31
	122

Goal 2: To ensure an adequate food and fiber supply and food safety through improved science-based detection, surveillance, prevention, and education.

WORK PERFORMED FOR OTHERS

Training and consultation with other Federal and State agencies, universities, and private organizations contributes to improved statistics related to a safe and secure food and fiber system.

International Assistance Provided. NASS provided technical assistance and training to improve agricultural statistics programs in 12 countries. A NASS staff member completed a 2-year residency assignment in Ethiopia, and short-term assignments supported work in Chile, China, Ecuador, Ghana, Guinea, Kazakhstan, Mexico, Nicaragua, South Africa, Russia, and Ukraine. In addition, NASS's International Programs Office coordinated and/or conducted training programs in the U.S. for 137 visitors representing 23 countries.

National Animal Health Monitoring System (NAHMS) Layer and Egg Survey. NASS conducted a survey under contract for APHIS to study health and management practices in the egg industry in order to provide data for an array of purposes, including establishment of a framework for investigations of health and management issues such as disease outbreaks. NASS collected general health management information from layer and egg contractors in 15 States. NASS also provided statistical services such as sample selection, questionnaire development, data collection, data entry, editing, and summarization.

National Animal Health Monitoring System (NAHMS) Feedlot Study. NASS conducted a survey under contract for APHIS to study health and management practices in the cattle feeding industry in order to provide data for an array of purposes, including establishment of a framework for investigations of health and management issues such as disease outbreaks. NASS collected health management information from cattle feedlots with 1,000+ head in 12 States. NASS also provided statistical services such as sample selection, questionnaire development, data collection, data entry, editing, and summarization.

Broiler Growers Survey. NASS consulted with representatives from Purdue University, Duke University, and the Farmers Legal Action Group on survey design and methodology for a survey of broiler growers in

10 broiler producing States. NASS provided the sample and consulted on questionnaire design. The survey was conducted under the auspices of Purdue University.

Pesticide Data Program. Continued statistical assistance has been provided to the Pesticide Data Program, a cooperative project between the Agricultural Marketing Service, Grain Inspection, Packers and Stockyards Administration, and ten individual State agencies to measure pesticide residues in selected commodities at the wholesale level.

FSIS. NASS personnel reviewed the statistical content of a draft of a FSIS-prepared document, *Hazard Analysis and Critical Control Point-based Inspection Model Project In-Plant Slaughter.*

Goal 3: Through research and education on nutrition and development of more nutritious foods, enable people to make health promoting choices.

WORK PERFORMED FOR OTHERS

Statistical consultation improves the quality and accuracy of surveys which contribute to improved knowledge of nutrition and food consumption patterns.

ARS - Nutrient Data Laboratory. NASS provided continued statistical consultation to ARS's Nutrient Data Laboratory. This consisted of designing and implementing a national level food product sampling plan from retail locations for the Laboratory's National Food and Nutrient Analysis Program. Consultation was also provided on aggregating nutrient data from different sources in conjunction with the Laboratory's Architecture and Integration Management Nutrient Data Bank System.

ARS Dietary Surveys. Continued statistical advice was provided on the sampling design for future dietary surveys, data analysis of current and previous ARS surveys and the transformation of food intake survey data into nutrient components.

Goal 4: Enhance the quality of the environment through better understanding of and building on agriculture's and forestry's complex links with soil, water, air, and biotic resources.

STATISTICAL RESEARCH AND SERVICE

Remote sensing technology employed by NASS provides valuable information used to monitor the environment and study the interrelationships between man and all natural resources.

Use of Remotely Sensed Data and Area Sampling Frame Development. NASS used remote sensing data to construct area frames for statistical sampling, estimate crop area, create crop-specific land cover data layers for geographic information systems (GIS) and assess crop conditions. For area frame construction, NASS combined digital satellite data with U.S. Geological Survey digital line-graph data, enabling the user to assign each piece of land in a State to a category based on the percentage of cultivation. During fiscal year 1999, a new remote sensing based area frame and sample for Mississippi was implemented and new frames constructed for Pennsylvania and North Carolina. The Area Sampling Frame is essential in providing agricultural statistics which have complete coverage of all farms.

The Remote Sensing Acreage Estimation Project analyzed Landsat-5 Thematic Mapper (TM) data for Arkansas, North Dakota and South Dakota from the 1998 crop season. End-of-season TM analysis

produces crop acreage estimates for major crops at State and county levels plus a crop-specific categorization usable for a digital GIS data layer. Cooperative agreements between NASS and the State governments of Mississippi and Illinois, along with NRCS in New Mexico, were established to become effective during the 1999 crop season.

In addition to conventional survey data, vegetation condition images based on National Oceanic and Atmospheric Administration's Advanced Very High Resolution Radiometer (AVHRR) data aid analysts in assessing crop conditions throughout the growing season. NASS maintained a popular Internet website, updated biweekly throughout the 1999 crop season, to display AVHRR-based vegetation indices of current, previous year data and a ratio of current data to a four-year median. The Mid-Atlantic drought, for example, was very apparent on the July 16-July 29 period images.

Goal 5: Empower people and communities, through research-based information and education, to address the economic and social challenges facing our youth, families, and communities.

CENSUS OF AGRICULTURE

Information from the census of agriculture provides periodic detailed data down to the county level which facilitates locality-based policy and business decisions affecting the agricultural industry and rural residents.

Fiscal Year 1999 Activities. The February 1, 1999, release of the 1997 Census of Agriculture results will be marked as one of the most significant dates in NASS history. The Agency was able to release all national, State, and county data from the 1997 Census of Agriculture on that date, approximately 10 months earlier than previous censuses, and only 12 months after the questionnaires were due from the Nation's agricultural operators. NASS hosted a ceremony to commemorate this occasion on February 3, 1999, at USDA's Jamie L. Whitten Federal Building in Washington, D.C. Many Federal officials and staff as well as private citizens and representatives from the agricultural community celebrated with NASS at the event. Many NASS field offices held press conferences and similar celebrations to mark the notable and timely release of these important data. In addition to providing the first census conducted under the authority of USDA and providing the data nearly a year earlier than ever before, this census also provided the first counts of American Indian operators on reservations.

Electronic and Printed Products. Over 9,500 individual electronic files were prepared and released on February 1 to provide data down to the county level. State and county profiles and highlights were prepared which answer many of the most commonly asked questions. Page-images of the printed Volume 1 Geographic Area Series reports from all 50 States and the United States Summary were released on the Internet, in February, in Adobe Acrobat Portable Document Format files. A new product, *County and State Profiles*, was released on the Internet with the Volume 1 data release; these *Profiles* show what occurred from 1992 to 1997 for selected items such as land in farms and market value of sales, displayed graphs of the number of farms and number of full-time farmers, and provided rankings for the particular State or county for the top commodities. *County and State Highlights* tables were released concurrently with the *Profiles* and Volume 1 tables on the Internet. The Volume 1 publications arrived from the printer in early spring, but NASS field offices and Headquarters were able to print tables and text from the reports, on demand, for customers until the actual publications were received from the printer. NASS also produced and distributed a new *Quick Facts* brochure, charting numerous variables from the 1997 census data. CD-ROMs of the 1997 census data, which contained customized viewing and extraction software, arrived in July 1999. The census *Ranking of States and Counties* report was published in May and was released on the Internet; printed publications were available in July 1999. The *Ranking of Congressional*

Districts Report, which ranks the top Districts for 215 selected items, was printed in July, along with the *Congressional District* and *ZIP Code Tabulations*.

Outlying Areas. Censuses of agriculture results were published and available on the Internet for Puerto Rico, Guam, the U.S. Virgin Islands, the Northern Mariana Islands, and American Samoa.

Special Studies. Based on farms that indicated in the 1997 Census of Agriculture that they irrigated, produced aquaculture, or grew horticultural crops, there were three special studies conducted in fiscal year 1999: *The 1998 Farm and Ranch Irrigation Survey*, *The 1998 Census of Horticultural Specialties*, and *The 1998 Census of Aquaculture*. The aquaculture census marks the first-ever enumeration to measure this diverse industry. The horticulture census is conducted every 10 years. Each of the special studies provides more detailed data on key segments of the agricultural industry which is not available through the census of agriculture conducted every 5 years.

WORK PERFORMED FOR OTHERS

NASS provides consultation and special assistance to others for special projects which provide valuable feedback about both employees and customers of USDA.

ARS Administrative and Financial Management Climate Survey. NASS provided consulting on questionnaire development, and provided data entry and summarization support, to ARS's Administrative and Financial Management for a Quality of Work Life Survey.

Wildlife Damage Survey NASS conducted a survey under contract for the Animal Plant and Health Inspection Service (APHIS), Wildlife Services to study losses of livestock to wildlife in 24 States. The producers surveyed were 11,777 Wildlife Services Clients who raised cattle, sheep, and goats. NASS statistical services included consultation on questionnaire design, data collection, data entry, editing, and summarizing. A report was provided to Wildlife Services for their internal use.

ERS Agriculture Market Information Use Survey. NASS conducted a nationwide survey of agriculture market information users under contract with ERS and in conjunction with the Mathematical Policy Institute. The purpose of the study was to identify what types of market information was most useful and to research ways in which USDA marketing information could be modified or redirected. NASS provided a sample of 750 producers and conducted a mail survey with telephone followup.

Migrant Labor Housing Survey. NASS consulted with the Rural Housing Service regarding ways to collect statistically defensible data on housing conditions of farm workers in the Midwestern and Western migrant streams in order to provide a baseline of information on migrant housing conditions and needs.

Goal 6: Enhance partner institutions and information systems to facilitate achievement of the REE Goals.

AGRICULTURAL ESTIMATES

LOGO Redesign. Effective June 1, 1999, a new NASS logo was implemented to capture the Agency's diverse agricultural statistics program. Prior to the development of the new logo, two were being used by NASS at the national level: the traditional "contour farming" emblem and the census of agriculture barn. As NASS prepares for the challenges of the next century, it is important that its name, reputation, and logo are well-known to the entire agricultural industry, including NASS's State partners.

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