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FEDERAL SOIL CONSERVATION
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1976

HEARINGS

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENT, SOIL
CONSERVATION, AND FORESTRY

OF THE

COMMITTEE ON
AGRICULTURE AND FORESTRY

UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

COUNCIL BLUFFS AND MOVILLE, IOWA

JULY 6, 1976

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FEDERAL SOIL CONSERVATION COST-SHARING PROGRAM

TUESDAY, JULY 6, 1976

U.S. SENATE,
SUBCOMMITTEE ON ENVIRONMENT,
SOIL CONSERVATION, AND FORESTRY OF THE
COMMITTEE ON AGRICULTURE AND FORESTRY,
Council Bluffs, Iowa.

The subcommittee met at 10:40 a.m. at the Leo Ryan farm located near Council Bluffs, Iowa. Hon. Dick Clark, presiding.

Present: Senator Clark.

Also present: Representative Harkin.

STATEMENT OF HON. DICK CLARK, A U.S. SENATOR FROM IOWA

Senator CLARK. The hearing of the Subcommittee on Environment, Soil Conservation, and Forestry of the Committee on Agriculture and Forestry will come to order. We're pleased to have Congressman Tom Harkin from the House Agriculture Committee with us this morning.

I just want to make a few brief remarks at the beginning. I particularly want to welcome all of you to this hearing. Today's hearing is an attempt to get a better feel for how well our soil conservation programs are working or not working, as the case may be. We want to be talking today to those of you who use the programs, to those who administer the programs in the field, to farmers, and to local and State representatives of the SCS and Department of Agriculture.

Quite frankly, it's been my impression in the 4 years that I've served in the Senate, that very little has been done on this problem. To the best of my knowledge, we've never held any hearings, either in Washington or outside of Washington, on the subject. It's something that's come to be taken for granted over the years, and so it was my feeling that it would be a good idea to get the Congress more interested in this as we continue to increase production, as we continue to demand more of farmers by way of greater productive capacity. Obviously, we run some great risks in what that does to the soil.

When one realizes that we have lost over half of all the topsoil in this State over the last century, you begin to become increasingly concerned about the other half. This hearing is the beginning of what we hope to be a long-time emphasis on the problems of soil conservation, how we're spending our money, and needed program changes over the next several decades.

We're going to be holding a hearing this afternoon up in the Sioux City area, and then we're going to be doing this across much of the State in the next several months.

We're here because we're particularly concerned about how we're using our resources—our soil and our water. I believe that we have sound soil conservation programs. We've just been out looking at a number of them in the Indian Creek watershed, in that program, and in some others.

We've developed and refined these programs over the last 40 years until they are, in fact, quite effective. I believe we can point to progress over those years, both in terms of the investment made in structures and in practices and in terms of the appreciation shared by farmers, civil servants, and others, for the need to protect and preserve our irreplaceable soil and water resources.

Now, in spite of this real and important progress that we've made since the 1930's, I'm convinced that we are still not using our soil and water as wisely as we must if we are to preserve for our children and grandchildren our fields and forests so that they, too, can enjoy abundant food and fiber. Too many of our streams are clogged with silt. And too many farmers find that they cannot afford the cost of the facilities and of the practices needed to stop these critical losses.

Today we have a national foreign trade policy based on full production in agriculture. The foreign exchange from agriculture sales is vital to the strength of the U.S. dollar, and vital to our commitments for aid to poor nations, as well. So we eagerly support this policy, but we do so with the recognition that it makes many more acres vulnerable to the ravages of erosion and depletion.

We cannot sustain a full production agriculture if it means that we must mine our soil to achieve it. We must have a fully adequate companion conservation policy parallel to our trade policy, to go hand in hand and insure that all our resources are adequately protected. We must reinvest in our resources as we use them if we are to assure ourselves that our high levels of production will be sustained.

I'm convinced that the programs responsible for protecting these resources are being taxed beyond their limit right now. I'm told by the experts that we have had critical losses in the past 2 years in this State and in this part of the country, and that conservation needs are greatly exceeding program capacity at the present time.

I am particularly concerned in this regard by what appears to be an effort in the Government to significantly reduce the ACP and SCS conservation operations program. The ACP program is to be reduced from \$285 million in fiscal 1975 to \$90 million in fiscal 1977.

Now, let me just repeat this. In 2 years we're being asked now by the administration to cut from \$285 million to \$90 million. Now, quick arithmetic, I guess, would show that we are talking here about coming up with less than a third of the money for cost sharing for ACP as we are spending in fiscal 1975.

The Senate has recently passed a bill, S. 2081, the Land and Water Conservation Act of 1976, which requires that an appraisal of land and water resources be made every 5 years, and the findings reported to Congress. We hope that this will give us a mechanism to better come to grips with the growing need for investment in conservation in this country. This will be a joint process involving the Department of Agriculture, the Congress, as well as the users of the program. In one sense, today's hearing is an early step in that process.

In preparation for this hearing, the local ASCS county committeemen for each Iowa county were asked to estimate the program needs

on an annual basis for their county under two assumptions: if there were no budget constraints; and, those which are sufficiently pressing that they should be done even though the budget is tight and funds are short. We now have responses from most of the counties. I hope we will have the responses of each in time for the close of the record on these hearings.

But, in general, the responses that I have now estimate our most urgent needs to be substantially above current program levels. Now, that's just to meet the most urgent needs. We've got to do better in terms of funding than what we are doing presently.

However, the needs do not seem to be impossibly large. I don't want to generalize further about these responses until I have seen all of them, but I feel somewhat encouraged at this point, because they appear to be describing a task which is well within our means if we appropriate the funds to do it. At the same time, I am concerned that we are not moving more swiftly and effectively to strengthen the focus of the plan and to achieve a level of investment in our conservation programs that would safely permit us to maintain production at the present level, or at even higher levels, if that becomes absolutely necessary in the future.

It is my specific purpose here today to listen to those who use our soil conservation programs and those who operate them here at a local level. We have a schedule of persons who will appear, and we have asked them to limit their remarks to 6 minutes each, although their entire comments will be put in the record, because we have scheduled a similar hearing, as I said, up near Sioux City this afternoon, so it's going to be necessary to leave here promptly at 12:30.

However, the record will be open for 30 days for any material from anyone here who wishes to include it in the official record, and all you have to do is mail it to us, and I can assure you that it will be made a part of the record, and we will be happy to mail the record back to any of you who are interested in it.

At this time, I'd like to ask Congressman Tom Harkin if he has some comments.

STATEMENT OF HON. THOMAS R. HARKIN, REPRESENTATIVE IN CONGRESS FROM THE FIFTH DISTRICT OF IOWA

Mr. HARKIN. Thank you very much, Senator Clark, and I want to thank you for this opportunity to enter my testimony before your committee on the needs for continuing Federal support for soil and water conservation activities.

I can assure you that as a member of the House Agriculture Committee, that we join with the Senate Agriculture Committee in making sure that these funds for these programs will not be cut in the future, making sure that the level of the funding for the agriculture conservation program, the Soil Conservation Service, and the watershed planning and programming will continue, at least at the level it has been in the past, and that it is not cut back.

I'd like to ask that my comments be made a part of the record of this hearing.

Senator CLARK. They will be made a part of the record.

Mr. HARKIN. Again, I'd like to commend you for coming out here in the field, so to speak, for these hearings, rather than sitting in

Washington, D.C., and listening to all the experts testify. It's good to come out here and hear firsthand just what the farmers and the soil conservation people have to say about it.

Considering some of the weather that we have had out in western Iowa and in central Iowa, where I live, I can think of no topic that is more appropriate for the hearing than what we have under discussion here today. Certainly the crop damage and personal property loss that has recently occurred is tragic, but I believe the most significant and least noticed loss has been the excessive soil erosion.

Recent soil losses in this area were in excess of 30 tons per acre during one storm, further depleting one of our Nation's most precious nonrenewable resources. Unfortunately, increased soil erosion has not been just the result of freak weather, but more importantly, the result of a Government attitude that's been encouraging fence-row-to-fence-row crop production while ignoring the toll that this activity has on the soil resource base of this country.

There is little doubt that the recent policies have increased soil erosion beyond tolerable limits. You mentioned the fact that we now have half of the topsoil that we had a century ago. Recent work by Dr. John Timmons of Iowa State University indicates that since 1957, soil erosion increased 22 percent on 113 farms that were studied in the Ida and Monona County Soil Association area in western Iowa.

Average erosion was found to have increased from 14.1 tons per acre annually in 1957 to 17.2 tons per acre in 1974. Now, to complement this increase, it is not just to Ida and Monona County, but I'm sure that it's occurring throughout the country as we continue in the same policy of fence-row-to-fence-row production while ignoring the need to expand soil conserving practices.

Let me just say a word here about cost. Certainly the farmer, I don't think, can be expected to invest in conservation practices and to take land out of production, considering the high cost of land today, which offers no hope for paying for itself. I think it's clearly in our society's best interest to insure that soil losses are minimized. Not only will this preserve the resource base for producing food and fiber for future generations, but also will aid in reducing the No. 1 pollutant in our surface waters, which is soil.

Now, some people in Government have said that farmers ought to bear the full cost of these conservation projects. I do not agree. Conservation benefits all the people of this country. It's an investment in the future. The person living in New York City or Chicago or even in Council Bluffs who wants to insure a future supply of food and fiber had better be interested in preserving soil and water to grow that food and fiber.

By the same reasoning as used by these misguided individuals in the administration, I can point out that I never ride the railroad. Therefore, none of my tax dollars ought to go to help support the railroad. But, the railroad is going to help all the people of this country, and I am more than happy to provide some of my tax dollars to see that the rail system survives, just as the people in New York, Chicago, and Los Angeles ought to be happy to see some of their tax dollars go for soil conservation practices to insure the soil is kept for future generations.

In closing, I would like to ask that your committee will consider all means necessary to increase the effectiveness of every dollar spent

for conservation. Certainly we don't want to throw away money at a time when we are trying to bring our Federal budget more into balance with our revenues.

So I'm sure that there are things in the conservation programs as there is in every bureaucracy of this Government that can stand to be tightened up. I would think this would include authorizing only those practices which directly abate soil erosion, and to investigate means of reducing administrative costs associated with the program and put more dollars where it will do the most work, and that is in the actual soil conservation program.

Again, Senator Clark, I want to thank you for this opportunity to appear at the hearing. I hope that it will serve as a catalyst to renewing this Nation's commitment to preserving our soil. Thank you.

Senator CLARK. Thank you very much. The next witness will be Dale W. Nelson. Dale, do you want to come right up here.

If those of you here who are scheduled to testify, will fill out a registration form which is on the table in back of the room it will be helpful to the committee.

Also, if you have extra copies of your statement, it would be good to bring them over to the table to my left so that people have access to them.

The witness is Dale W. Nelson, who is the executive director of the Iowa Farm Bureau. Dale, you proceed in any way you think appropriate.

**STATEMENT OF DALE W. NELSON, EXECUTIVE DIRECTOR,
IOWA FARM BUREAU, DES MOINES, IOWA**

Mr. NELSON. Thank you, Senator.

We appreciate this opportunity to express our views on this very important subject.

Farmers of the Nation are meeting the challenge to produce food and fiber at record levels for our people and the people of the world. Without our record production, hunger in many areas of the world would be much more severe than it is now.

Iowa has a larger percent of highly productive soil than any other State. We have adequate rainfall and the length of the growing season necessary to produce high crop yields consistently. Our farmers have a responsibility to use these resources exclusively to alleviate hunger at home and abroad. Extensively, I should say.

However, it is in the interest of the general public and the producers that our natural resources are not exhausted by continuous heavy usage. We are concerned about this possible development, and we appreciate the concern expressed by the Senate Agriculture Committee in holding these field hearings.

Our program for soil and water conservation in Iowa is an excellent example of the effective cooperation between private citizens and State and Federal agencies. Over 105,000 soil conservation cooperators have more than 20 million acres under cooperative conservation agreements. More than 60,000 miles of terraces, 247,000 acres of grass waterways, 37,000 farm ponds, and almost 20,000 grade stabilization structures have been constructed.

In 1973 a State cost-sharing program was established, and during the last legislative session, \$4 million was appropriated for this pro-

gram. Iowa is the only State which has a cost-sharing program of such scope. Our State conservancy law provides a system to monitor excessive erosion and take steps to abate such erosion.

Our soil and water conservation program must continue to expand if we are to prevent excessive water and wind erosion while continuing full production. Action should be taken to eliminate the barriers which have curtailed planning and development of small watersheds. The entire land surface of our State is in drainage basins of our major rivers. Watershed planning and development is essential for effective soil conservation in many areas of Iowa.

Farmers have also taken positive action to control erosion without the benefits of cost-sharing programs. Thousands of acres are in grass waterways established by individual farmers. Minimum tillage or no tillage practices are used on about 7 million acres, and more farmers are changing to these conservation tillage methods each year.

A voluntary program of this magnitude is evidence of effective efforts by farmers to prevent deterioration of our natural resources.

As an organization, we have actively promoted soil and water conservation by conducting water use surveys in cooperation with State agencies, presenting awards to district and regional soil conservation contest winners, publicizing conservation tillage methods, and encouraging the use of conservation educational materials in our schools. We shall continue our efforts to promote these conservation practices and will maintain our natural resources at a high level of productivity.

Under conditions in which full production is encouraged, a high priority should be given to soil and water conservation. The present voluntary cost-sharing system will continue to be effective if greater efforts are expanded to promote the importance of conservation, and the incentive to participate is available on a continuing basis.

Establishment of permanent conservation structures is a long-term investment which should be beneficial to the individual farmer as well as the general public.

Senator CLARK. Thank you, Dale. Let me just ask you a couple of questions. Is it your feeling or do you tend to believe in terms of reaction from your own members, that there is money being wasted in the soil conservation area? Is there any area, as our Committee looks at this, that we ought to be skeptical of in terms of what we are funding now?

Mr. NELSON. Well, I think much less is being wasted today, probably, than earlier years. I really don't have any record or don't hear of very much of it that is.

I think we are really concerned, as one of you gentlemen made the statement here before, that we actually use these moneys for what will benefit agriculture and our Nation, as well as the farmers, and really make them be on conservation practices.

Senator CLARK. Now, the other question. There is a lot of controversy, obviously has been for several years, about the whole idea of cost sharing. I gather from your statement that you tend to feel that we ought to maintain these cost-sharing programs.

Mr. NELSON. Yes, we certainly do.

Senator CLARK. Tom, do you have a question?

Mr. HARKIN. No.

Senator CLARK. Thank you very much.

Mr. NELSON. Thank you.

Senator CLARK. Next we're going to hear from Mr. Ervin Koos of Shelby, Iowa, who is a farmer up in Shelby. Come right on up.

Now, I think, if I'm not wrong, Ervin, you're in the National Association of Conservation Districts, right?

STATEMENT OF ERVIN J. KOOS, NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS, SHELBY, IOWA

Mr. Koos. Yes, I'm Ervin Koos, a member of the board of directors of the National Association of Conservation Districts, and I farm near Shelby, Iowa. Of course, you know that NACD is a spokesman for America's nearly 3,000 soil conservation districts.

I'm here to encourage support for programs that will assist and promote the planning and maintenance of shelterbelts. This is a forestry hearing as well as agriculture, and maybe it doesn't totally pertain as heavily to Iowa, but it does to the Nation.

You recall when our early citizens began their trip West across the Missouri, they ran out of trees that were familiar in the East. Instead, found vast areas of treeless plains. This same journey today will find the plains between Missouri and the Rockies literally dotted with trees of many types. These midwestern plantings are among the most noticeable of the established shelterbelts and farmstead windbreaks in our country, but they are not the only ones, for trees have become an important management tool in the recent years nearly everywhere.

Now, trees help protect against damaging wind and water erosion. They reduce soil moisture losses. They increase crop yields, provide shade for livestock and nesting cover for wildlife areas. Now, these trees increase livestock gains, they reduce farm fuel consumption, add to the beauty of the countryside, they absorb noise, and consume carbon monoxide. We've been told that an acre of trees produce enough oxygen for 18 people. So, that makes it very important.

Many of the early shelterbelts are in need of renovation. Others need relocation because of changing farming techniques.

You know, there has been introduced in the House of Representatives, that Representative Tom Harkin knows about, two bills referring to the Shelterbelt Act. They provide incentive funding for planning, modification, and renovation of shelterbelts. These bills provide assistance when the tree plantings are a part of a farm or a ranch conservation plan—and this is what we're talking about today—prepared with technical assistance of the local soil conservation service and approved by the local soil and water conservation district.

Now, NACD, the National Association of Conservation Districts, encourages action programs of this type because of our basic principal: Conservation applications should be a part of approved conservation planning.

You've all heard about the tree planting effort up in North Dakota. They said that if each farmer would provide 200 trees, their State would have 8 million new trees, and they would provide many, many benefits to the farmers. Farmers in Central States need to protect their soil just as much as those in the Great Plains or in the western cattle ranches.

At the height of the world demand for food and fiber, it does not stand to reason that society should turn its back on one of the important resources such as forestry. The Federal Government has encouraged "fence-row-to-fence-row" agriculture. If it takes this position for balance of trade payments, it should extend technical and financial assistance for protecting the soil resources.

Shelterbelts are an important step in the protection of our resources, but for those times involving high winds and damaging droughts, they have a real purpose to serve. NACD supports the concept of a separate Shelterbelt Act, separate from other federally funded forestry activities. Now, we at NACD support the concept of long-term agreements for installation of shelterbelts, for like the soil, windbreaks are a long-term investment and provide many benefits to society, and they take many, many years to establish. Changes in farming operations usually occur over a long period of years rather than in a single year. So, that's the way we have to look at it.

In closing, NACD appreciates this opportunity to present its views on such an important issue that serves to protect the vast agricultural base that this country enjoys. We hope there will be speedy action in the forthcoming Congress. Thank you very much.

Senator CLARK. Let me ask you one question, Ervin. I think you've stated this, but I'd just like to have it very specific for the record.

What role and what do you think the Congress or our Government, the Federal Government, ought to play in terms of shelterbelts? What is your recommendation?

Mr. Koos. Well, in many places they're being destroyed, some of them due to disease and some due to age, and they need to be redone. I think we need to keep it a very important part in this particular area here, as they become windbreaks for farmsteads and the like. We do need a tree program. We need a forestry incentive and we need to have the protection. We need to do everything that will eliminate soil erosion, moisture loss, and conserve fuel.

Senator CLARK. Well, now, what can the Federal Government do to stimulate that or encourage it? What is our role or what shall we do about it?

Mr. Koos. Well, they can put out a good equitable and adequate cost-sharing program to either maintain, renovate, or establish new ones.

Senator CLARK. Good.

Mr. HARKIN. Ervin, let me ask you on this cost-sharing program for the Shelterbelt Act which is now in the Conservation Subcommittee of the House Agriculture Committee. We have a State nursery—I don't know how many State nurseries there are, maybe somebody can tell me—but we have one, I know, up by Ames. They grow trees and things for along the interstate and things like that.

I'm just wondering if perhaps they couldn't get involved in starting the seedlings for the trees that might be used for these shelterbelts. Do you know if the State nursery has done anything like that?

Mr. Koos. I think every year they exhaust their supply—very early. Most of the species that they have available. But, you see, when you establish a shelterbelt like we're talking about, there is quite a bit of cost involved, because it does need to be protected.

They can be productive trees as well as the other benefits that they provide, and they have to be fenced and they have to be maintained,

they have to be kept weed free and this type of thing, until they can get themselves completely established.

Mr. HARKIN. I can just tell you as one person, I do a lot of flying. I have my own little airplane, and I fly a lot over central Iowa. I really concur in what you said about these trees being taken down. You can fly over some areas, I think, specifically, over around Dallas County and Story County and areas like that, where you just don't see any trees. They have all been taken down.

Mr. Koos. Well, of course, you know, the demand of "fence-to-fence," that means taking out the fence and plow up that, too, and when you do that, if there's a tree in the road, that's the destruction of the tree. We can't afford that. We either have to maintain some of them or relocate some of them according to society's requests and patterns of the time.

Senator CLARK. Good. Thank you very much. We're going to hear next from Clifford Stille, who is a farmer over at Macedonia. Clifford, you just proceed in any way that you think appropriate. I think if you hold that microphone about that far away it will work pretty effectively.

STATEMENT OF CLIFFORD STILLE, CHAIRMAN, EAST POTTAWATTAMIE COUNTY SOIL CONSERVATION DISTRICT

Mr. STILLE. A short time ago, Senator Clark, I heard you ask about whether cost sharing was needed.

Senator CLARK. Yes.

Mr. STILLE. Well, that just fits in exactly with some of the information that I have brought this morning. I am also chairman of the East Pottawattamie Soil Conservation District. We took these figures here that I would like to present this morning from the records of the East Pottawattamie Soil Conservation District.

Senator CLARK. Good.

Mr. STILLE. Now, this is one district only.

Senator CLARK. I understand.

Mr. STILLE. In regard to the hearings of the Senate Committee on Agriculture and Forestry, I submit the attached information.* This information is taken from the records of the East Pottawattamie Soil Conservation District.

As you can very well see, the amount of cost-share funds available has a direct influence on the amount of terraces applied to the land. No cost-share funds were available to the farmers in the first half of 1973. The State of Iowa cost-share program was implemented July 1, 1973, and we did get 20 miles of terraces built that fall. However, this was about one-third of what could have been done with normal funding.

Money was available in 1974, but farmers and contractors had had many plans disrupted in 1973, and they were cautious in 1974. In other words, rotation plans were disrupted so that it wasn't convenient to apply terraces.

Not until 1975 did we get back to normal. This year, with both State and Federal funds available, it looks like a recordbreaking year for applying conservation to the land. We already have 35 miles com-

*See p. 85.

pleted out of 45 miles laid out for construction, and ordinarily the spring of the year is a very short construction.

Senator CLARK. Yes.

Mr. STILLE. District cooperators are very interested in doing more. We have had in our office applications for nearly \$143,000 of cost-share money already since the first of January.

Senator CLARK. \$143,000?

Mr. STILLE. \$143,000. And that is 50 percent of the total, because this is just the amount of cost-sharing figures here.

Senator CLARK. Yes.

Mr. STILLE. And this figure does not include any ACP requests, either, from the ASCS office.

Then I referred you to the table on page 2, and for the people that don't have copies of this, in the year 1971 we completed 45.3 miles of terraces in East Pottawattamie County. In 1972 we completed 57.9 miles of terraces. In 1973 we completed 20.5, just almost exactly one-third as much. In 1974 we gained a little back. We got 42.4 miles of terraces in east Pottawattamie County. In 1972 we completed 57.9 spring, and it looks like we can meet the 60-mile figure this year, weather permitting.

I also have in here the conservation needs in east Pottawattamie County, and in 1967 the total land was 285,051 acres.

Senator CLARK. Now, that's land under production or is that total land?

Mr. STILLE. That is total land. Total cropland is 253,677 acres. Pastureland, then, is 17,926 acres.

The terraces needed in 1967 was 6,274 miles for 101,225 acres.

For 1976, we estimate the total cropland is now 265,603 acres, because the hay land and pasture has been reduced.

Terraces needed, then, of course, have risen to 113,151 acres, or 7,028 miles, minus 2,125 miles that we already have on the land, or needed yet is 4,903 miles of terrace in east Pottawattamie County.

At the rate they have been applied, and not counting 1973, it will take 96 years to complete this job of adequately protecting the land with terraces in east Pottawattamie County.

And, of course, then, we referred to the personnel ceiling which is limiting our work, and we feel that Congress needs to do something about raising this personnel ceiling. The Office of Management and Budget does not seem to want to do this voluntarily.

We could make more progress in conservation with more people. We figure we are 6 months of heavy terrace layout, and during the other 6 months we need one more good man for planning and contact with cooperators and so forth in setting up the program and promoting it.

Programs will take much more staff time in the future. We feel that WAE does not solve the staffing problem, as we cannot get and keep good employees with WAE conditions.

Another area we might look at, and this has been brought up here this morning, is the cost of administration of cost-sharing funds. What is the total cost to the taxpayer of the actual application of the practices on the land? I think this is something to really take note of. I would like to point out here that Iowa's cost-share funds are 100-percent available for construction, as the additional work of cost-share administration has been absorbed by the present staff, and as it's

been administered by the soil conservation district commissioners, which are not salaried.

Federal cost-sharing administration takes about \$1 for every \$1 used for construction, and we feel this could be improved upon.

So, this is all I have to offer, and I do thank you for the opportunity to present these facts to you.

Senator CLARK. I think it's an excellent statement. I think it's the kind of thing that is particularly valuable, because it breaks down in number of acres and number of miles of terracing and how many years it would take, 96 years, you say, at the present rate to do this, and begins to show something in a very specific statistical way. We thank you very much.

Mr. HARKIN. You say it takes about \$1 of administration for every \$1 used for construction. That seems high to me.

Mr. STILLE. That's Federal.

Mr. HARKIN. That seems high.

Mr. STILLE. That's your ACP program, because of your high administrative costs in these offices.

Mr. HARKIN. What's the administrative cost involved in that? Why are they so high?

Mr. STILLE. Salary. There are more salaried people in there than we have in our office.

Mr. HARKIN. Could they do it with less people?

Mr. STILLE. I don't think I'm in a position to make that kind of an observation. We're doing it.

Mr. HARKIN. I didn't ask you for your unbiased observation.

Mr. STILLE. You see, I'm speaking from observing the thing, because we are not salaried.

Mr. HARKIN. I understand that.

Mr. STILLE. And the county committeemen, of course, are paid. We do get mileage and expenses, but we donate all of our time.

And we have picked up this State cost-share program, and this is just added in with a little more load that the district commissioners already have. We've gone ahead and administrated that, and that is the reason for the statement that almost 100 percent of the State cost-sharing funds go out here on the hillside, because the present staff is absorbing all the additional workload.

Senator CLARK. Thank you very much.

Mr. HARKIN. Thank you.

Mr. STILLE. Thank you.

Senator CLARK. We're going to hear next from Dale Awtry, whose home is in Lake City, but he is the State executive director of the ASCS. Mr. Awtry, we're happy to have you here. Go right ahead and proceed in any way appropriate.

**STATEMENT OF DALE H. AWTRY, EXECUTIVE DIRECTOR, STATE
AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE,
LAKE CITY, IOWA**

Mr. AWTRY. Senator Clark, distinguished guests, ladies, and gentlemen.

I wish to take this opportunity, sir, to compliment you and your committee for looking into the ACP program which is now 40-years

old, and I think that it is probably time a thorough review of the program procedures and goals should be made.

The finest delivery system in all of Government is the ASCS county and community elected committeemen system. It's track record is, without doubt, the most outstanding. Who's better qualified to know and understand the conservation needs in a county better than the farmers and ranchers themselves?

Farmers and ranchers who have been elected to the committee in each county have confidence that the elected officials will fairly and without prejudice carry out their duties to the best of their abilities. This is true not only in ACP, but in other programs administered by the county for ASCS elected committeemen.

The need for wise soil conservation on the land is self-evident. What could possibly be more important to this country, or the world for that matter, than to protect this most valuable of all our natural resources—highly productive land.

This natural resource, unlike coal, iron ore, oil, and so forth, is a reusable natural resource, and every year if we practice sound soil conservation, it will continue its bountiful production for centuries to come.

Please tell me what better legacy we can leave our children, our grandchildren, or our great grandchildren than truly well-conserved land.

The ACP program is the only active program from the New Deal days that has not actively been overturned by the Supreme Court, and we have pretty much followed the same lines in trying to improve farm income for some 40 years. I believe that all of us will agree that after 40 years of conservation, we should take an in-depth look at ACP and see if its goals truly fit with the modern tillage and cropping patterns that we see on the land today.

I would also like to mention that Secretary of Agriculture Earl Butz has proposed in his bill No. S. 3299 to ask that a review be made of the entire ACP program, and I am most certain that he would hope that this is the forerunner of other hearings that will be held in other parts of this Nation on the subject of ACP.

One of the most important questions that the committee should review is the one of the ability of the individual to complete those practices that are income producing and do not have as their prime objective stabilization of the soil.

Cost sharing with farmers and ranchers for conservation practice on the land is still, in my estimation, the most feasible avenue to follow. In how many other federally financed programs are the recipients willing to cost share with the Government on at least a 50-50 basis. We have always been cognizant of the proven low income farmer or rancher and made special dispensation for their needs.

I wish to state that I truly believe in sound, wise soil conservation, but something is remiss when for 22 years, every President, regardless of party affiliation, has seen fit to ask for zero funding for ACP.

I believe it is now time for the Congress to examine itself and see if they, in the past, have used sound judgment in ACP programing. Somewhere surely there is a common ground where the executive branch and the legislative branch of the U.S. Government can stand collectively and say this is a sound soil conservation program.

Senator CLARK. Thank you very much. Let me just say, Mr. Awtry, that we appreciate your statement, and I think it's quite accurate to say that after 40 years, we do need a review of this program. I think it's gone on and on, and I think the feeling that many of us have is that the permanent practices that go into soil conservation are very worthy of cost sharing, and that we'd like to continue this. And I think that probably we have a quarrel with the administration to that degree.

I think the temporary practices ought to be reviewed very, very carefully in terms of their cost effectiveness and in terms of their overall value to the Nation as a whole, and that's really what much of this is about. I welcome comments from any of you in terms of the specific programs, permanent or temporary, which you feel are most important, and most important in continuing.

Mr. AWTRY. Well, Senator, 40 years ago we were still using horses, and we were at the advent of the tractor age. Well, I don't have to remind anybody in this room, a tremendous revolution has gone on in agriculture in the last 15 to 20 years, and many of the types of practices that we did use, even though money was widespread, is now antiquated and maybe have to be done again. But, I don't see anything wrong with that, either.

None of us can stop progress, and who can see 20 years from now, we may have to do some of what we've done over, again. But, we can't pay our deficits and so forth without this land. I'm sure that everybody in America realizes that today.

Mr. HARKIN. Not everybody. I wish everybody did.

Mr. AWTRY. Well, let's try and educate everybody.

Senator CLARK. That's right. That's it. Thank you very much. We're going to hear next from Mr. Kendall Olin, who is—

Mr. OLIN. State conservationist.

Senator CLARK. State conservationist, right. Very good. I should have known that, Ken. I think, Ken, if I remember right, you're speaking for the State SCS—your statement is for the State SCS.

We had the pleasure of going with Ken this morning and touring the Indian Creek watershed project and looking at a number of things that are underway down there, and we thank you particularly for that.

You go right ahead and proceed in any way you think appropriate.

STATEMENT OF KENDELL OLIN, REPRESENTING WILLIAM J. BRUNE, STATE CONSERVATIONIST, SOIL CONSERVATION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, DES MOINES, IOWA

Mr. OLIN. Thank you very much, Senator Clark. We enjoyed showing you the work that has been accomplished in the Indian Creek watershed.

I'm representing Bill Brune, our State conservationist with the Soil Conservation Service in the State of Iowa. He regretfully had to miss personally attending this hearing. He has prepared a statement which he previously submitted, and I leave additional copies with you.

Senator CLARK. We'll make that part of the record.*

*See p. 71 for the prepared statement of Mr. Brune.

Mr. OLIN. Of course, the Soil Conservation Service in Iowa and across the country does provide technical assistance for the conservation program that is in operation, and we do assist individual groups and units of government in planning and applying the conservation work that is needed, also assisting in the small watershed program which is active in this part of the State and throughout the country. Our assistance is given through the 100 soil conservation districts in Iowa, and we work through them based on their local policies and procedures to assist the people.

Just a couple of points that I will glean from Mr. Brune's statement that I think would be of interest to the group, his statement does indicate the total needs in conservation in Iowa. We have a pretty good estimate as to what the total needs are. Generally, throughout Iowa, about one-third of the work has been completed on about 26 million acres of cropland. So, that does leave a tremendous amount of work to be done yet in the State of Iowa.

The cost for completing all the practices in the State has been estimated at \$2 billion, with about \$1.6 billion needed for terraces, alone. This does not include the technical assistance that would be needed to get this work installed. This is just the actual practices, themselves.

Senator CLARK. So most all of it is money for terracing, \$1.6 out of \$2 billion.

Mr. OLIN. Terracing, of course, would be the primary practice, because it is a practice that can be used on the cropland that is used for intensive agriculture, which a majority of the State is being used for. The most effective permanent type of practice is the terracing practice.

Of course, the conservation tillage and other related practices are very important, but the high cost items and the permanent-type work would be the terraces, cropland terraces, primarily.

That would complete my statement unless you have some questions.

Senator CLARK. Good. That's a valuable thing. I guess that would figure out about 80 percent of the total cost. And you're saying, then, in short, if you look at this whole problem of soil conservation, that as you see it, as your director sees it, in the State, we're about a third of the way through that process, and that the money that is still needed is around \$2 billion by present estimate, and that of that, \$1.6 billion—and my mathematics is not very good—but I guess that's probably 80 percent or so is needed for terracing.

Mr. OLIN. Yes.

Senator CLARK. I think that is valuable to know. Tom, do you have any questions?

Mr. HARKIN. Yes. Is this cost, this \$2 billion cost or the \$1.6 billion you are estimating, is that projecting more marginal land being brought into production or is that basically just what we've got right now? For example, in testimony we heard from Clifford Stille, he pointed out that just since 1967, in east Pottawattamie County, total cropland has gone from 253,000 acres to 265,000 acres. That's 12,000 more acres in just 8 or 9 years.

In this cost that you are telling us, have you projected ahead and said there is more marginal land going to be brought into full production or have you just said \$2 billion for what we've got now?

Mr. OLIN. Well, this is based on the best information that we have, conservation needs inventory, and a review of our current agricul-

ture, and to the best of my knowledge, this is based on our current needs.

Mr. HARKIN. Current needs?

Mr. OLIN. Right.

Mr. HARKIN. But looking down the road, don't you foresee that more and more of this land is going to be brought into production?

Mr. OLIN. There will be, as time goes on, more of the more fragile land brought into production.

Mr. HARKIN. Sure, to meet the needs for terraces.

Mr. OLIN. Right, and that would be meeting it. The information I have is that this is a conservative estimate at this particular time. I'm sure that the need in the end will be larger than that. Of course, as the years go on, the costs increase.

Mr. HARKIN. What is the status of conservation tillage right now, are more and more farmers picking up on the practice? Is it pretty widespread?

Mr. OLIN. It's generally on the increase as farmers learn to live with it and understand it and do all the things that are needed to be done. Conservation tillage is catching on and it's an item that we are promoting, you know, very aggressively. It is catching on. It's a slow process, but there is more conservation tillage done each year.

Mr. HARKIN. Maybe this isn't a fair question, but are the extension people getting this word out on conservation tillage? Are they doing much on that?

Mr. OLIN. Oh, yes. All agencies are cooperating, and they have taken this on as one of their major items.

Mr. HARKIN. OK, that's good.

Senator CLARK. One other thing in that regard as we were traveling around this morning that might be good to have in the record, I think you said there are now 100 soil conservation projects, or what is the right term?

Mr. OLIN. Small watershed projects, Public Law 566.

Senator CLARK. One hundred small watershed projects. Of those, you said that over the last 20 years, that 16 of them have been completed?

Mr. OLIN. Sixteen are all completed.

Senator CLARK. And you've got another, what did you say, 24—

Mr. OLIN. There are 24 that are in various stages of operation.

Mr. HARKIN. Is that just for the Indian Creek Watershed?

Senator CLARK. No. Indian Creek is 1 of the 16. Well, it would be 1 of the 24 that is about to be completed?

Mr. OLIN. Right, 1 of the 24 that is about to be completed.

Mr. HARKIN. You are talking about the full watershed?

Mr. OLIN. Well, these are individual watershed projects that have gone the route.

Senator CLARK. So when these 24 that are being worked on now are completed, you'll have about 40 percent, I guess—yes, 40 percent of 100 projects completed, so you still have got 60 of them yet to begin?

Mr. OLIN. Right. And I'm sure there will be other people's testimony about the need and the interest. There are groups organizing all the time. The demand for this work is tremendous.

Senator CLARK. Thank you very much.

Mr. OLIN. Thank you very much.

Senator CLARK. We're going to hear now from Paul and Marian Jacobson from Crawford County, Dow City. Mr. Jacobson is an engineering-farmer. Where is Marian?

Mrs. JACOBSON. I only typed.

Senator CLARK. I see. We'll see how well you did.

STATEMENT OF PAUL JACOBSON, DOW CITY, IOWA

Mr. JACOBSON. We thank you, Senator Clark, for a chance to attend this hearing.

As you said, you mentioned engineering-farmer. I used to be State conservation engineer for the Soil Conservation Service here in Iowa.

Senator CLARK. I see.

Mr. JACOBSON. Worked all over Iowa, so I got a pretty good idea of what happened. I worked 30 years in the Soil Conservation Service.

I'd say it is indeed gratifying to find someone in high Government circles that's interested in conservation and set out this goal. And your announcement indicated that you're alarmed at the fact that there is an increase in erosion and has been in the last few years.

Referring to the Iowa State University report mentioned by Tom Harkin, Dr. Timmons wanted to be sure you got that in the record, that whole thing you got in there—that 22-percent increase. And I think that you know why that came about. It came about because of the intensive cropping that we've gone into from agricultural programming, we're increasing erosion.

You don't need to look around this country to know why, because all the land is clean till crop.

My former colleague in Soil Conservation Service just mentioned that we're a third done with the job. You know that 12 years ago when I retired from the Soil Conservation Service, we said we're 30 percent done with the job in Iowa, believe it or not. What are the accomplishments of the last 12 years in soil conservation? Zero, if his figures are right.

So, I believe it's time we did something about soil conservation to get the thing off dead center and get it going, don't you?

Part of this lack of progress, of course, comes about because of the fact that at that time some 10 years ago, we were depending greatly on a rotation to control erosion. In other words, this was one of the major practices to control erosion. The land here is 90 percent clean till crop. As you know, you can't carry on a rotation when you have this high percentage of corn and beans.

Then along comes the USDA program of all-out production and it is impossible to control erosion by rotation. Today our big bandwagon is minimum tillage, and in essence, on my farm, we started out 5 years ago with a buffalo till planter, and we went the whole rigamarole of different methods of minimum tillage. Last spring and last fall I had quite a bit of the land plowed with the conventional plow, the mold-board plow. Why? Because of all the difficulties we had with weed control, and a lot of other problems which on minimum tillage haven't been solved.

If you asked our tenant today—he made this statement to me the other day—he said we're going to have to plow more land next year. Why? Because all these problems.

Well, what I'm saying, Clifford Stille made this statement that we need more terraces. You see, this is the basis. You can go back to the Inca's. What did they do to control erosion? It's the only remnants of real erosion control that's left from 4,000 years ago is terracing, isn't it? And this to me is the only way we're ever going to control erosion if we're ever going to do it. So, the effort should be put on this particular type of practice to get it going.

Now, I've talked to both you and Berkley Bedell and my friend Tom Harkin here and Bob Bergland of Minnesota, and we've tried to get an upland terracing program going. Several years ago the SCS established the Macedonia watershed, about a 1,000-acre watershed, which is completely terraced. Why did it get terraced? Because farmers working together got into the program to push terracing in that watershed. We pushed this terracing program and farmers working together got the job completed.

Now, what I've suggested, if you want to get this thing moving and get it so 10 years from now we don't have 30-percent erosion control finished after another 10 years, I think that you've got to try some new things. I think one of these is to go out and follow what was done at the Macedonia watershed and get some more watersheds established. Use them as pilot projects. Let farmers solve the problems we have with terracing.

If you go in and straighten out terracing like I've done on my farm, when you get heavy intensive rains, you are going to get some sediment deposited in some of these areas that are going to give you difficulty in both harvesting and working the crop. These are problems that occur only on a small acreage. On my farm it covers about 30 percent of the land.

Now, in closing, I'm not going to belabor this subject, but I do believe that it's time to quit kidding ourselves about erosion control, and about our accomplishment. In other words, 10 years from now are we going to come and say, well, we have done a good job, we've got 30 percent of the job done, or are we going to say we've tried some new things the last 10 years and we're up to 25 or more than 50 percent of the job done.

I think that it takes some of these new approaches. In other words, try this watershed. Let's get about 12 watersheds of 1,000 acres set up around in the United States in the next 10 years and get them completely terraced. Let's find out the problems we have with terraces in the Corn Belt and then solve these problems.

In closing, I'm going to invite both you and Tom Harkin to visit my farm north of Dow City. It's been visited by a number of the folks who are attending this meeting. If you come to Dow City they'll tell you the Jacobson farm is the farm that's completely terraced. If any place has almost zero soil loss, it's the Jacobson farm.

The State committee of the Soil Conservation here in Iowa is going to hold a tour, as they do annually, and on the second of September is the present date, and I personally invite both of you, and I think you can look at this demonstration and see what can be done. We'll also talk about some of the other problems we've had, because we've had them. But, as people say today on that farm, they say there is only one way that farm can go, and that's better, because we are keeping all the soil right there on the farm. I thank you.

Senator CLARK. Thank you very much. It's an excellent statement, and although Marian did a good job of typing it, you didn't follow it. And I'll make a deal, we'll meet back here in 12 years and we'll see if we're not further along than 30 percent the next time we meet.

Mr. JACOBSON. You bet.

Senator CLARK. Good. Thank you. That's the second of September?

Mr. JACOBSON. Yes, the 2d of September. You are going to get another letter in the mail.

Senator CLARK. If we're around there anywhere near, we'll be there.

Mr. HARKIN. I haven't been out yet, as you know, Paul, but my agriculture staff has been out there, and Paul and his wife came to Washington, when was that, last fall sometime?

Mr. JACOBSON. A year ago.

Mr. HARKIN. About a year ago, and commandeered a room there in the majority whip's office, and we had a slide presentation which was really good.

And I encourage everybody that's interested in seeing what can be done on that size of a project to go up and visit. When is it, September 2d?

Mr. JACOBSON. Well, actually, we can't invite all the people to come on September 2d. They can come some other date, because this specific date is for the State committee, and I don't want the crowd too big. I want to keep it down to about 40 people.

Mr. HARKIN. I don't know if it said in here, I didn't follow the whole testimony, but what did you reduce your slope by? Remember you were telling me in Washington that time that you had—

Mr. JACOBSON. On the one hillside there we had a 16-percent slope when we started. Today, the maximum slope anywhere on that hillside is 12 percent. We haven't done anything that all the rest of you wouldn't normally do. In other words, erosion is occurring between terraces. The only difference is that I've got it there on the farm and some of you let it go down to the Gulf of Mexico.

Senator CLARK. Okay. Next we're going to hear from Lowell Gose, who is a farmer over in Jefferson, Iowa, in Greene County, and although it doesn't say so here he is president of the Iowa Farmers Union. So, Mr. Gose, you come right on up.

We have eight more witnesses, and 8 times 6 is 48, and we have 48 minutes, and so we're going to try to spend 6 minutes with each of you.

You go right ahead, Lowell, and proceed in any way you like.

STATEMENT OF LOWELL E. GOSE, PRESIDENT, IOWA FARMERS UNION, JEFFERSON, IOWA

Mr. GOSE. Thank you, Senator Clark and Congressman Tom Harkin.

Both of these gentlemen know where I live. Senator Clark had headquarters at our home.

Senator CLARK. That's right. I slept there one night walking through on Highway 30. Very true.

Mr. GOSE. Whenever I try to get someone to come stay all night, I say, "Senator Clark slept in that room, and it ought to be good enough for you."

Senator CLARK. They don't show up, either, do they, when you tell them that?

Mr. GOSE. Oh, yes, they do.

Well, we are here today to deal with soil and water conservation, a subject in which I say there needs to be a really serious revival of interest. With the rise in demand from food deficit countries and the lifting of acreage restraints in this country, we are beginning to pound our land pretty hard.

On too many farms now, there are no grasses or lagoons in the rotation, no sod waterways, no contouring or terracing on erodible slopes. Every heavy rain brings down another fan of silt to follow the lower ground and to damage the productivity of the higher ground.

The almost universal custom of recent years over much of Iowa to fall-till all cornfields and even some soybean stubble has led to much spring wind erosion. The dust blowing off fields in our part of the State got so bad one day early this year, that motorists had to turn on headlights to avoid collisions. And I haven't seen that for several years, but boy, we sure had it again this spring.

I might say that I bought a chisel plow a year ago and chiseled my soybean ground, and it just laid there like perfect, you know. Didn't blow a bit. And I'm sure that I'll continue to use it for that reason alone.

A number of developments seem to account for the slackening of interest in soil conservation. The use of commercial fertilizer, herbicides, and insecticides made continuous corn or a straight corn-soybean mix an attractive option. It became easy to believe that occasional erosion losses would be offset by fertilizer inputs.

At the same time, a rapid increase in machinery size led many a farmer to take on more and more acreage by rental or purchase. However, this also made him less and less patient with other than minimum time, straight row, least crop mix farming.

Even so, these changes out on the farm do not account for all of the slippage in soil conservation interests. For one thing, the U.S. Department of Agriculture leadership in the past few years has scarcely been helpful. It lobbied against continuance of the longstanding program of Federal cost sharing with farmers.

In 1973 program funds were held up until congressional action forced their release. The conservation cost-sharing provisions were rather skimpily and tardily communicated to farmers.

In 1974, it was March 28 before our local ASCS office could advise farmers of the practices eligible for partial compensation. That was far too late to influence farm operating decisions. This year, the timing was a little better, with the notice mailed in February, but still too late. Considering how cropping plans nowadays begin to take shape soon after, and I might say even before the fall harvest, some way must be found to advise farmers then of program availabilities.

With the main contact between farmers and local ASCS offices having been ended with the abandonment of acreage adjustments, it has become more important that the communications through the mails on cost-sharing programs be more detailed and explicit. It is not enough to advise, as our 1976 notice did, that "practices will be cost shared at 50 percent of cost not to exceed amount determined by the county committee. . . . If interested, please stop by the office for full details."

Now, what is also needed along with earlier programing and more certain funding is greater effort on the part of the USDA apparatus to arouse interest in soil conservation. As it was mentioned once before

and maybe twice, why wouldn't it be a good idea to take the lead and deliberately seek program participation at several points in a county where nearby farmers could come and see for themselves how the practice is working out?

A visit to a properly contoured or terraced slope after a heavy rain might be quite convincing, or likewise, to see how runoff loss for crops was held down after a dry spell. This could be a valuable addition to the projects conducted by the State and other Federal conservation agencies.

In the past, there has been a tendency to frown on sharing practice costs that seem mainly to have yield-increasing effects. That was when the Federal Government was substantially funding acreage adjustment programs. With that activity largely phased out and in view of the inevitable future needs for maximum productivity, the case will grow, I think, for more emphasis on the long term, yield-increasing facilities such as tilling and onfarm flood control installations, as a matter of public benefit.

Some day it may be proposed that penalties be imposed for inadequate soil care. In fact, Iowa already has an injunction provision against property owners whose failure to control erosion results in damage to other properties.

Senator CLARK. Very good. A good statement.

Mr. GOSE. Thank you very much.

Senator CLARK. We appreciate very much your coming over from Jefferson to give it to us. Thank you.

Mr. HARKIN. Thanks, Lowell.

Senator CLARK. Mr. Roy Fagan, program specialist, Iowa State ASCS from Des Moines. Roy, we're pleased to have you here, and go ahead and give your statement or summary or whatever you think appropriate.

STATEMENT OF ROY FAGAN, PROGRAM SPECIALIST, IOWA STATE AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE, DES MOINES, IOWA

Mr. FAGAN. Senator Clark, Representative Harkin, my remarks are from the standpoint of program operation in the State ASCS office.

Senator CLARK. In other words, you decide the cost sharing, and that's the part of it, particularly that as a specialist, that you're addressing us on?

Mr. FAGAN. Well, the program operation for the cost sharing, ACP.

Senator CLARK. Right; good.

Mr. FAGAN. The Iowa ACP cost-sharing program begins shortly after national announcement of the program in Washington, D.C. The State program development group consisting of representatives from Extension Service, Soil Conservation Service, Forest Service, and soil conservation districts, meet with the State ASC committee in development of the State program. Other interested persons may also attend this meeting and offer recommendations. The State group formulates a State plan for program operation which provides guidelines and policies to county committees.

More responsibility was given to county committees and the county development group in 1976 to develop their county programs and cost-share rates to the extent that the State ASC—or ACP, rather, is now a composite of all county programs.

The State program development group beginning with the 1975 program year has allowed county development groups to select any 1970 and 1974 practices in the State program in those years. In addition, the county development group could request permission to use any 1970 or 1974 national practices not in the State program.

Assignment of technical responsibility for practice need and application to the land is made by the State development group to the SCS, Forest Service, and State wildlife biologist. Only practices requiring technical assistance are assigned. Other practices are the responsibility of the county committee.

The State allocation of program funds provides for a transfer of up to 5 percent for technical services with the balance prorated to county committees, primarily on the conservation need shown in the conservation needs inventory publication of 1970.

Upon receipt of their county allocation of funds and development of their program, county committees announce the county ACP and begin accepting requests for cost sharing. Priorities are assigned to practices as they relate to the overall conservation problems in the county. They are also established for individual requests for cost-share assistance. Farm allowances, conditional, first come, first served or factored cost-share approvals are not authorized.

The 1976 State allocation received January 12, 1976, for cost sharing was \$6,811,000, with nearly all being distributed to county committees on January 15. Only a sum of \$340,550 needed to pay for technical services remains at the State office.

No statewide limitation was established for long-term agreements which last from 3 to 10 years. Each county committee decided whether they would offer long-term agreements and the amounts of funds to be obligated from the current allocation for the life of the agreement. The number of agreements approved is not known at this time, but appears to be considerably less than in previous years.

A State allocation of \$8,215,815 was received on April 8, 1975, for the 1975 ACP. The State limitation within this fund for obligations for the life of long-term agreements was \$1,200,000, later increased to \$1,800,000. Nearly all of this sum was obligated.

Also contained in the State allocation was \$2,343,815 to cover obligations for 1975 and future years' practices of the 1974 long-term agreements. Funds not required to cover these obligations were later transferred to annual practices. County committees could request funds as needed to approve agreements within a certain limitation. The limitation was used to insure equitable distribution to counties.

The allocation to county committees for annual practices was made on May 2, 1975. Preliminary reports for these annual practice cost-share approvals for six practices are as follows: Terracing, 34.9 percent; waterways, 19.6 percent; tiling, 14.3 percent; water storage reservoirs, 10.3 percent; permanent vegetative cover, 6.5 percent; and erosion dams, 5.6 percent.

Now, for the 1974 RECP, Iowa received \$3,207,000 on January 14, 1974. Now, we had \$30,000 in this for the new forestry incentive program. And long-term agreements from 3 to 10 years were first offered in 1974 with a limitation of \$463,000 in the current year and a total limitation for the life of the agreements of \$1,850,000. Approvals were terminated when either one of these limits were reached.

Now, the money was spent for the six leading practices: Terracing, 52.6 percent; waterways, 15.4 percent; water storage reservoirs, 14.3 percent; erosion dams, 11.1 percent; diversion terraces, 3.1 percent; permanent vegetative cover, 2.2 percent.

Now, you know that the 1973 REAP was implemented as the result of a court decision, and that gave us \$8,722,000 there on April 9, 1974. Well, that money was spent, as follows: Waterways, 20.6 percent; tile, 19.9 percent; terracing, 18.4 percent; water storage reservoirs, 12.1 percent; permanent vegetative cover, 7.9 percent; and erosion dams, 7.7 percent.

But a survey made in late 1974 found that we had requests out there that couldn't be approved for \$5,900,000.

Senator CLARK. Let me—since the time is up—let me stop you, Roy, but I'll make the rest of it part of the record, because a lot of it is very good statistical information.

I'd just like to ask you one question, and it's a simple question, but it might be hard to answer, I don't know. In your experience, what one thing do you think the Federal Government or Congress ought to do differently as you look at it from your vantage point that would help in terms of soil conservation?

Mr. FAGAN. Well, I think our biggest problem, at least in recent years, is to get the program announced early enough. Also, if we could get the increased funds, because I feel that we have a need for much more conservation. A definite need. Farmers do make their requests early, but they sort of lose any hope, because the county committee can't definitely approve them for what they want to do.

Senator CLARK. So you say move earlier so that you get the information on how much you're going to get by appropriations earlier, so you can start acting earlier in the year?

Mr. FAGAN. Right. That's my answer.

Senator CLARK. Tom, do you have anything?

Mr. HARKIN. I don't have anything.

Senator CLARK. Thank you very much. We appreciate it. We want to keep the whole statement so that we can put it in the record. It's got a lot of good statistics in it.*

Ron Gahring from Williamsburg, land improvement contractor, the first one we've heard from, I think. We're pleased to have you here.

Let me just say that after this, we'll have Tom Magill. So, if he'll be ready.

**STATEMENT OF RON GAHRING, LAND IMPROVEMENT CONTRACTOR,
GAHRING CONSTRUCTION, INC., WILLIAMSBURG, IOWA**

Mr. GAHRING. Thank you, Senator Clark and Congressman Harkin.

My remarks are as a contractor and one who tries to put this practice in work, and I would take issue with some of the remarks that have been made about the Federal program.

Agriculture Secretary Earl Butz has referred to the ACP as the biggest giveaway program in the United States today. In part, I would agree with him. I don't, however, think this was the intent of Congress when the practice was created. At least, I hope not. I would

*See p. 73.

rather than that the administration has turned it into this in spite of Congress.

To see the need for ACP, one need only come to rural America and look at the land, talk to the people. Look at the field drainage tile laid 4 feet deep in the ground less than 10 years ago, now lying exposed; not in a gully, but in the middle of a broad flat field, 4 feet of the soil washed away from cropping the ground year after year.

The average farmer is not to blame. He really cannot afford to do anything different. He can't afford to consider conservation from a financial standpoint. In most cases, he needn't worry about depleting the soil in his lifetime, and why is it only his obligation to save it for future generations.

He has to contend with the high cost of land, machinery and money, and the Government is encouraging him to crop every acre and raise all he can, then controlling his efforts to market his products. The only thing pushing him to conservation is his conscience; his conscience and a fear of some faraway bureaucrat forcing him to conservation. Many of the conservation jobs we work on today are done by farmers who are afraid that if they don't start such measures, they will soon be forced to, at a rate they can't afford.

I think their fears are justified. In fact, I have seen examples of it in Iowa's conservancy law. In my opinion, the ACP could offer an alternative to such forced conservation; the Government offering to help pay for measures which the farmer couldn't possibly receive back his investment from, at least not in his lifetime. Measures like tile outlet terraces which save the soil for future generations.

However, the policies of the various administrations have imposed more restrictions on the program; restrictions which, for 40 years, have kept the program on the ground. In checking with the Iowa State ACP administrator, I found that there has never been a directive to consider the land first in the administration of the funds. Instead, there have been a great many directives to simply spread the money around. In effect, play the numbers game; do a little something for everybody; make it a welfare program; pay less than 50 percent wherever possible; try to pick projects which aren't too expensive so more can share in the program. All those done under the guise of getting the most out of the tax dollar. In reality, it has meant piecemeal conservation; not ever getting enough done to cure any major problem.

In Assistant Secretary of Agriculture Robert Long's remarks before the 30th annual meeting of the National Association of Soil Conservation Districts, he credited them with, and I quote, "Putting roughly one-half of all U.S. farmland under excellent conservation protection."

I hope that he is the only one in Washington who is so poorly informed. We just heard this morning that we had a 22-percent increase since 1965, and a great many of the waterways that have been laid out and worked on in the past are now plowed under. Just under 10 percent is a much more accurate figure.

What's more, we wouldn't be that far if we hadn't picked on the easy targets; the small projects which stop the gully on the family farm by putting a pond at the upper end. For such projects as this, \$2,500 went a long way, and it did help stop the gully. But, in Iowa

County, where we're losing an average of two bushels of topsoil for every bushel of corn we raise, that's not much progress.

We need, first of all, to quit considering this program as a welfare program; stop administration policies of not sharing with the same farmer 2 years in a row; not cost sharing with landowners who might afford to do the work without the funds; not sharing with landowners who do not rely solely on the land for their living; and other such policies.

Instead, be concerned with putting conservation on the land and saving the soil. Once the program is headed in this direction, then, it needs funds. Not the token amounts it has had in the past, but the funding of a responsible people concerned about saving their land.

To send \$87,000 to Iowa County to pay 50 percent of the \$22 million worth of terraces needed—and that's just one practice—is like trying to fill a bathtub with an eyedropper. It's almost equally ridiculous to limit the funding to \$2,500, when the average farm needs \$30,000 worth of work done at today's prices. At the current \$2,500 every other year, it would take 24 years to get these needs established, and we're still building terraces for four-row equipment today when most of the major implement manufacturers are pushing four- and six-row—or six- and eight-row planters.

The program is needed, but not as much as Mr. Butz' pork barrél, but as a responsible government paying its share of one of our country's most urgent needs. EPA funds should be used; tax advantages should be considered; more funding of ACP with new directions for its use; and more technical research to keep up with the changing demands of agriculture; all to stop our soil loss.

Your efforts in the past have been commendable, but your job in the future is staggering. And I would be the first to admit I don't have all the answers, but my family has had three generations in this field to see what the needs are.

I thank you for this opportunity, and the written copies of my testimony I will send to each of you along with the documentations of some of my remarks. I apologize for not having them ready.

Senator CLARK. Not at all, but be sure you don't leave without giving us a copy, because it's an excellent statement. It's a very challenging one, and we want to have it in the record.* If you prefer to take it home and type it and mail it, that's fine, or we can take it just the way it is. It's an excellent statement.

I don't think I have any questions that can improve upon it. Is that accurate that we lose two bushels of topsoil for every bushel of corn?

Mr. GAHRING. Yes, sir, that is a very accurate figure.

Senator CLARK. That's amazing. I never heard that quoted before. I must say, too, that we're working right now to try to get this \$2,500 limit raised in the next agriculture act, because it's one of those things that has existed for several years. In terms of the inflation that has taken place, it's just not practical.

Mr. GAHRING. Thank you very much.

Senator CLARK. Tom Magill, you come right up, and then we're going to hear from—I'm not sure of the pronunciation—Dean Eilts from Wiota.

*See p. 75 for the prepared statement of Mr. Gahring.

Tom, you are from Cass County and you are a farmer.

Mr. MAGILL. Right.

Senator CLARK. Go right ahead.

STATEMENT OF THOMAS MAGILL, DISTRICT COMMISSIONER, CASS COUNTY SOIL CONSERVATION DISTRICT, LEWIS, IOWA

Mr. MAGILL. I'm a member of the Cass County Soil Conservation. I'm a commissioner.

Senator CLARK. On the district commission?

Mr. MAGILL. Yes. I'm also chairman of the Pax Indian Creek watershed, not to be confused with the Indian watershed you saw this morning.

Senator CLARK. Right.

Mr. MAGILL. Pax Indian Creek is a 160,000-acre watershed that is a little over 1 year old, and it's just getting started. And I might remind you gentlemen that we're going to need your help in the future. There has not been one planning started in the watershed this past year in Iowa.

Now, you heard Kendall tell you about the number of watersheds and plans and so forth. It looks hopeless to us when they got that many ahead of us, and yet not one is being planned in Iowa this year.

Serving as a commissioner, we volunteer a lot of time. We meet, I would say, an average of once a week on some soil conservation project, and we meet with these people in the watershed, and we have interest out there. People are going to do this work if they get some encouragement from the Government.

And I think they should get this encouragement, and I think money should be provided. I think that is the point I want to drive home, is that there are people out there who want to do this work if they're given an opportunity to. It's discouraging when we get our State funds and have to allocate them and not be able to come close to satisfying the people that want the help. We gave a lot of 25-percent aid last year. We turned a lot of people down. I know our county ASCS committee did the same thing.

So, as you face these problems, I think the country's going to have to screw their head on right and get our priorities in order, because we've got a valuable asset. As you mentioned, these two bushels of dirt for a bushel of corn, and that's a 5-ton soil loss. Three weeks ago we lost 50 bushels of dirt off our soil, off our farms over there, and if we produce 100 bushels of corn—

Mr. HARKIN. You got heavy rain out there, didn't you?

Mr. MAGILL. Yes. That's 50 bushels all gone in one rain. So, I would encourage you to give us some help in this. I've written a statement and given it to one of your assistants.

Senator CLARK. All right. Thank you very much. We appreciate it. Dean Eilts. Am I pronouncing your name right?

Mr. EILTS. Eilts.

Senator CLARK. Mr. Blunk is going to be next. Now, you are a farmer?

Mr. EILTS. You bet.

Senator CLARK. Good.

STATEMENT OF DEAN P. EILTS, WIOTA, IOWA

Mr. EILTS. As Cass County, Iowa farmers, the opportunity to appear before members of the U.S. Senate Committee on Agriculture and Forestry is appreciated.

We respectfully submit testimony in favor of a greatly expanded Federal conservation cost-share assistance program for farmers throughout the Agriculture Conservation program, ACP.

Farmers are genuinely concerned with the need of conserving our most basic natural resources—soil and water. Yet, should they be expected to bear the entire cost of conserving these natural resources to assure future generations an adequate supply of high quality food at reasonable prices? The people of all walks of life have a stake in and responsibility for conserving the natural resources of this great country.

With the high cost of crop and livestock production and the increased cost of establishing conservation practices on the land, farmers cannot accept the theory that farmowners should maintain their own land. Since 1973, the increased cost of establishing conservation practices has increased 35 percent.

Senator CLARK. Thirty-five percent in 1973?

Mr. EILTS. Right. Recently, a young county farmer reported that a cost estimate for three terraces was over \$7,000. These terraces were determined necessary to provide 75 percent adequate upland treatment on a 60-acre tract of land to maintain soil and water losses within allowable limits established by the Soil Conservation Act passed by the Iowa Legislature in 1970. For this farmer, a cost of over \$100 per acre.

As a result of extensive rainfall from storms of June 12, 13, 14 and again on June 19, 1976, considerable damage occurred on the farms in the county through extensive soil erosion. The County Disaster Committee, with input from the agricultural agencies of USDA, determined that 3 million tons of soil were lost due to erosion.

Farmers responded to the call for all-out production to produce food to feed this country and the world. Farmers are now calling for the Federal Government to respond in providing greater financial assistance in the adaptation of soil and water conserving practices on the land. Farmers are willing to match dollar for dollar with the Federal Government to get the job done.

Critics of ACP have stated that Federal funds for conservation have not been expended wisely, and that cost-share assistance has not been for long-enduring, high-priority permanent practices—not so in Cass County.

Beginning with the 1973 ACP program year, only high priority practices have been approved for cost-share assistance. These practices include: Establishing or improving vegetative cover, planting or improving a stand of forest trees, establishing sod waterways, terrace systems, diversion terraces, erosion control structure or dams, water impoundment reservoirs, and wildlife habitat.

Farmers in this county are paying more than 50 percent of the total cost of establishing these high priority practices on the land. Practice components of seeding and fertilizing terrace back slopes, waterways, and areas around dams and ponds are required but are not cost shared.

From 1970 through 1972, approximately 6 percent of the county's yearly allocation was used to cost share low-priority practices; wind-breaks and livestock water wells.

From calendar year 1974 with a combined allocation of \$144,296, 1973 and 1974 programs, less than 39 percent of the high priority practice applications could be approved for cost-sharing assistance.

In the 1975 program year, with an allocation of \$59,914, 12 percent of the high priority practice applications could be approved. Thirty-nine farms of the 1,597 farms in the county received Federal cost-share funds.

In 1976, with an allocation of \$68,674, less than 15 percent of the high priority applications could be approved for 44 farms.

For 1977 and future years, for high priority practice approvals for Federal cost-share assistance, an annual allocation of \$198,000 would be needed. This estimate is based on the number of applications received since the year 1973.

We are concerned farmers, and appreciate the interest shown by members of the Senate Committee on Agriculture and Forestry concerning the problem so vital to all of us. Thank you.

Senator CLARK. Thank you very much. There are a lot of good statistics in there, and we appreciate very much your coming over and testifying.

We're going to hear now from Lawrence Blunk from Atlantic, a farmer. Glad to have you here.

STATEMENT OF LAWRENCE BLUNK, DISTRICT COMMISSIONER, CASS COUNTY, ATLANTIC, IOWA

Mr. BLUNK. Senator Clark, Representative Harkin, and gentlemen. I am here as district commissioner from Cass County, regional director of west-central Iowa, region 5. I've been a farmer since 1938. I feel like I've been a dedicated person to soil conservation. I have done terracing since 1943, in the infant stages, did it the hard way.

In the essence of time, I am sending a written statement to you to read later to save your time.

We have four watershed projects in Cass County in various stages of growth and development, and our needs are tremendous. We have many projects that the funding is simply inadequate. I have a long-term agreement on my farm, and I can see the tremendous advantages of this type of an arrangement. In fact, I think Cass County has more long-term agreements than any county in the State of Iowa, and the funding—we could use unlimited funding for this project, and I think we'll find in time that this type of a project is the answer to ultimate conservation and the answer to many of our soil losses in this State.

We are so blessed in this State with having the "garden spot" of the United States.

Senator CLARK. Really, of the world.

Mr. BLUNK. Of the world, if you please. And we all need to work together in a dedicated program. I mean, really cooperating to make this thing a reality. To my knowledge, there is nothing more important than the stewardship of our natural resources of soil and water.

Senator CLARK. Let me ask you a question, by the way, if I may interrupt just a second. Why is this soil conservation district important? I mean, what is the role there? We've had nobody here that's really testified about the soil conservation district. You're a commissioner, a regional representative. What is the value of the soil conservation district?

Mr. BLUNK. Well, it's a highly organized conservation effort in each county of the State—a district. We call it a district. Each county is a district in itself.

Senator CLARK. Except for this one where we've got two, in Pottawattamie.

Mr. BLUNK. Yes, right, the only one in the State that has two. But, we are an organized district and we have our own unique needs and problems in each district. For example, we have a different need than an area up in northern parts of the State where drainage is a big problem. Soil losses is our big problem. Wind erosion, too.

Senator CLARK. Well, that's the sort of thing I wondered. What would happen—I mean, why is the district itself, the soil conservation district, important? I think it's particularly important for us to have that in the record. Why not simply have the SCS and the other Federal agencies working without the district? In other words, what role does the district really play?

Mr. BLUNK. Well, we are the ones that implement and engineer the terrace systems, the waterway systems, the various systems, and we have the basic knowledge through our technical staff to know where the basic needs are.

Senator CLARK. So you organize farmers in the local area, too, and then bring the technical assistance to bear on that so that you can begin to plan the conservation in that area.

Mr. BLUNK. Right.

Senator CLARK. Thank you very much. We appreciate it.

Mr. BLUNK. Thank you. I appreciate this opportunity to speak to you.

Senator CLARK. Lou Culver from Dunlap. Lou Culver farms up there, and I hate to have a whole list of these people that I stayed overnight with when I was walking across the State, but here's another one.

Lou Culver is a State senator, of course, from up in that area, and I know has been interested in soil conservation for years and years. He has served on the Iowa Resource—what is the exact title? I want to say the Iowa Resource Council, but it's the—

Mr. CULVER. Iowa Natural Resources and Air Pollution, Environment and Soil Conservation. Different things.

Senator CLARK. Good.

STATEMENT OF LOUIS CULVER, IOWA STATE SENATOR, DUNLAP, IOWA*

Mr. CULVER. Thank you very much, Dick and Tom. That's the way I'll speak of them, because, you know, after they come to your house that often, you do say it that way.

*See p. 88 for the prepared statement of Mr. Culver.

If I don't have to use this mike, I'll do without it, but I'll keep it somewhere in the vicinity.

We have several things that I'm going to send to you, Dick, and from our ASC office in Logan, also from our soil conservation office in Logan. They aren't here.

I would, at this time, like to introduce one of my cohorts, another commissioner, if he would stand up. He's from over here at Persia, and this is Walt Ware, and Walt and I have been visiting here and we kind of made up just a little story which we're going to tell. There is a lot of things that happened with this soil conservation. We've heard a lot of statistics, and we'll bring you statistics, and all kinds of them.

But, the SCS, Soil Conservation Service, the ASCS, the county conservation board, the supervisors, the extension office, are the ones that make this whole thing go, and they do work and they are successful if you have them working in your county.

I'm going to spend more time on watersheds, because I think watersheds is one of our big things, and it's been alluded to, but maybe not gone into detail enough.

Harrison County has the first watershed under Public Law 566 in the State of Iowa. It also has the first watershed under Public Law 566 in the United States. We have a few of them that were greedy from other districts in other areas that tried to steal it, but they weren't successful. It's 3,200 acres and it is just south of Logan, and it's a going watershed and been very successful.

We have other watersheds in Harrison County, and one of our larger ones is 62,000 acres, the Mill-Picayune watershed, and it doesn't only stay in Harrison County, it goes into Monona and Crawford County—not Monona, but into Shelby and Crawford, and you have to work with the different groups in these other counties. That's when you get the cooperation. You say, what do the commissioners do, your technicians. That's when you begin to work and that's what makes the ball roll.

Allen-Steer Creek is one near Mondamin. That's a beautiful one we couldn't quite get off the ground because we didn't have anyone to come up and pick up the 180-acre dam and the 140-acre dam. If we had a little bit of this extra money, instead of going into wells or something like that, I would like to see it go into some of these structures, and that's what we need, and we'd have a beautiful watershed.

We have another one, and it's a unique one for the State of Iowa, and that's Cobb Creek. I'll tell you where that is, it's Pisgah, and you know where Pisgah is, because it's made its name. It's one of the best watersheds around and it's done, and they're pretty well completed, but they need a little more money.

We could go on with different things than watersheds. I think our Mill-Picayune watershed is one that works so darn good in the area of Dunlap. We had a waterway that went through the town of Dunlap, and there are 39 houses there that got flooded every time there was a little rain at the edge of town. So we put in a watershed there, we put in a dam, and we got 39 easements, and we shaped the waterway and it's a complete watershed. It's one of the most unique things in the State of Iowa, and I'm not sure it isn't in the whole United States. It's right in our backyard here, and we have taken care of it.

I think another thing that I have to mention at this time, right at the present time we're just starting a new nursing home at Dunlap. The nursing home is on the—facing right over this lake, this watershed there. So we had to get into the soil conservation people. We had to level off, flatten off the top of a hill. So we took a slope and cut it down 20 feet, pushed the dirt over and put a diversion around it. We have 5½ acres of level ground there now, with a diversion on one side and the terraces on the other. Now, we're trying to get somebody to come up there and crown this. We want to tie it down.

Of course, some of your best specialists—and I'll condemn any of them who they are, whether they're soil conservation, extension or what—they said you can't plant until the 20th day of August because it's got to be moisture. Well, if I can plant that tomorrow, it's going to be planted, because as soon as it rains on it, which we haven't had much rain, that's when it will start growing. It won't until it rains.

We have something else I have to say with Harrison County, and we don't even just stay with Harrison County, we work with MAPA. What is MAPA? It's metropolitan area planning out of Omaha, and we have a complete plan on the Missouri River which works back to us. We also go into Monona County and run off SIPCO. You have to work with all of them.

I heard the bell ring, so time is stopped. But, I am going to say this one thing, and you have to say something about the legislature. This last year we had land use, and it did pass the House, but it did not pass the Senate. There were several reasons why it didn't pass. Fifty counties in the State of Iowa have a land use plan or have some zoning or something like that. Fifty of them haven't done one thing. Most of us did not think it was right to start in a land use plan with only 50 of them, and if 50 of them will get zoning or something done, work with their soil conservation or extension, their ACS, and get some groundwork out there and show that they have a good intent, land use will pass in the State of Iowa, and I hope it don't until then. Thank you very much.

Senator CLARK. Thank you, Lou. We appreciate your comments very much. I know that the legislature—I think the first witness today was complimenting the legislature on the fact that we had the only cost-sharing program—I think that was the testimony—in the United States at a State level. So we compliment the legislature on that.

Our last witness is Mr. David Williams from Villisca, who is a farmer, I think.

Mr. KINKADE. I believe I've got something, too.

Senator CLARK. Oh, I'm sorry. Well, we'll get lined up. We have two more witnesses, I should say.

STATEMENT OF DAVID WILLIAMS, VILLISCA, IOWA

Mr. WILLIAMS. Senator Clark, Representative Harkin, if I'm a bit nervous, it's because I am concerned about this, and as some of you know, I'm more used to chasing pigtailed than I am at giving talks. My wife did type this and I wrote this one evening prior to your original first talk, and I should add something to it, and I will probably send something.

I would just like to add one thing. I hope many of you take the National Geographic or take time to read two articles in the current

issue. One is written by an American Indian who has a tremendous philosophy talking about 30,000 years the Indians were here. We've only farmed Iowa a little over 100. The other one is about what we're doing to our land in America.

Conservation of our soil and water is a problem of which I am deeply concerned. It is a problem which has become more severe each of the past few years.

Thirty or 40 years ago erosion was even more severe than at the present time. Education programs of our land grant colleges, rural schools, Department of Agriculture, and the Soil Conservation Service, did an excellent job of making the Midwest farmer aware of the many advantages of soil and water conservation on our Midwest farms.

The farmers in and around Page County had the advantage of the soil erosion farm located between Clarinda and Shenandoah. Extensive research and statistics were compiled to point out the advantages in many ways to conserve our soil.

As a small boy in the 1930's and 1940's, I have a vivid memory of our trips to the field days at the erosion farm. My father was an early pioneer in all phases of soil conservation. First terraces being built with horse labor. I think, probably, just about the first terraces in the State of Iowa, if I'm not mistaken.

Senator CLARK. When would that have been?

Mr. WILLIAMS. In the early 1930's, built with the horses and the slip scraper.

To this day, my farm and the land owned by our family is under a very well planned conservation program. I hesitate to mention that the aforementioned soil erosion farm was abandoned for economic reasons and the fact that it was felt that it had served its purpose. It's quite evident that this was a gross error in judgment on the part of our State college and the farmers in this area.

I said I'm deeply concerned about the problem of conservation of our soil. I also realize that it's a complex problem, but one that can be solved if we would take a realistic approach to basic fundamental soil conservation practices.

I had the occasion to make numerous trips—and I'm talking about this spring—from my home in Page County to Des Moines, our capital, and between home and Kansas City, Mo. I believe, without a doubt, I've seen more severe erosion each of the last 2 or 3 years than I've seen in the last 15 or 20 years. Part of the erosion is due to some heavy rains, but this is hardly the problem. I'd like to direct my remarks on the causes of erosion that I observed to several points:

1. Emphasis by our farm publications, extension and USDA on profit and efficiency, and with a minimum amount of emphasis on soil and water conservation methods;

2. A large amount of fall plowing of our large acreages which has caused severe wind erosion;

3. Lowered in deficit margin in the cattle industry, which has encouraged the cultivation of land which should never be under the plow;

4. Lack of basic fundamental soil conservation methods. And I put examples here: Planting bean rows up and down the hill. It's just nothing but a waste of the land. Planting row crops up and down the hill with no regard to following the contour. The tearing out of terraces and waterways. And I couldn't sleep nights if I was that guy

that had that 4 feet of soil that washed out of those tiles. Plowing when minimum tillage would be adequate;

5. Planting soybeans on slopes that should never be planted with this crop;

6. The use of very large machinery which are not always conducive to good soil conservation practices;

7. The short-term approach and don't care attitude by many farmers;

8. The attractive margin in corn and soybeans that encourages an increase acreage in cultivation;

9. Farmers who actually don't know or care what to do with their soil; and

10. A lack of funds by our federally funded ASCS office to properly encourage and implement soil and water conserving methods.

I repeat this is a complex and not easily solved problem, but there are some solutions that we should implement at once. Our land grant universities should put a strong emphasis on conservation to the classroom and the many facets of our extension service. The extension service could, along by education process, bring the message to the attention of the farmer. The extension service could immediately make soil conservation a major project to be used in our strong 4-H program. This also could be stressed in the FFA program in our high schools.

The Department of Agriculture at the State and Federal levels should put priority on cost-sharing methods that are strictly based on sound fundamental conservation practices.

In Iowa, it seems we should immediately set up some soil conservation experimental farms geared to modern farming. This would be a very sound economic approach to putting emphasis on a very severe problem.

It was quoted in the Des Moines Register last year, 1975, that the economic loss of soil in Iowa was greater than the value of corn as a cash crop harvested from Iowa farmlands.

It is my belief that if the farmer wanted to organize and practice good conservation on our farms, we could get the job done. I'm afraid not enough farmers really care about this problem. I, for one, would not like to see a Federal or State land-use policy be established, but it seems evident if we don't in the very near future think seriously about conservation of our soil—and I put in parenthesis, the most precious resource on the face of the Earth—that the only result is for Government to establish a land-use policy for the American farmer.

Food is our most basic commodity in the world, and it would seem that with the complexity of providing food for an increasing population, we can't afford to continue the abuse of our land as we are doing at the present. To me, it seems the problem of soil conservation boils down to the same philosophy of the majority of the people: We are more concerned with quantity of life than with the quality of life.

We as Iowa farmers need to remind ourselves that the inch of soil we lose to erosion will take nature generations to replace. Well, really, millions of years. Stewardship of the soil is the most vital to the economic and social plight of our planet Earth.

Senator CLARK. Very good. It's an excellent statement, and we appreciate very much your coming over and giving it.

Mr. WILLIAMS. Well, I'm almost emotional about it, because I'll tell you, we live in Page County. We're farming land that should not be

farmed. I could take you down some roads where you can't believe what's being done. And I think we have to point our finger at ourselves. We're doing almost everything wrong. It makes me sick to go out and see some of it.

I would invite anybody to come see our farm. I would appreciate this—

Senator CLARK. Where is your farm located?

Mr. WILLIAMS. In north Page County.

Senator CLARK. How far from Shenandoah?

Mr. WILLIAMS. Well, we're 12 miles north of Clarinda.

Senator CLARK. Clarinda. Thank you very much. We appreciate it. Our last witness is Franklin Kinkade.

**STATEMENT OF FRANKLIN KINKADE, CHAIRMAN OF THE BOARD,
IOWA LAND IMPROVEMENT CONTRACTORS ASSOCIATION,
CRESTON, IOWA***

Mr. KINKADE. Honorable Senator Clark, Honorable Representative Harkin, distinguished guests, ladies, and gentlemen.

I have this to say, that I think our soils program is about as effective as the sparrow control in here. I think if the environmentalists got a hold of it, we'd have to cover these glasses, in case the sparrows tried to use them for target practice.

Putting kidding aside, Iowa's No. 1 resource is its soil. Government is urging all-out production, but not all-out soil and water conservation. With this increased production, which is, by the way, for the consumer and not the farmer, farmers are intensively cropping rolling lands which should be left for pasture or for long rotation. Consequently, although we've farmed Iowa for over 100 years, our topsoil is half gone.

The loss is an inch every 12 years. At that rate, our topsoil could be gone in another 100 years. Do you realize it takes 400 years to replace 1 inch of soil. An average of 230 bushels of topsoil on each acre of unprotected sloping land is lost each year.

While Congress is trying to set a national budget ceiling, the administration is still recommending zero for agriculture conservation practices. I would like to call to your attention several points. In 1936 the Congress passed the Soil Conservation Act, with provisions that Congress would authorize annually up to \$500 million for basic soil and water conservation practices. This year the national allocation, which has been decreasing drastically, would reduce it to \$85 million by the administration. However, Congress was successful in increasing the allocation to \$175 million.

The partnership arrangement in 1936 was to have the farmer pay 10 percent and all the rest of the citizens put up through taxes 90 percent. Through the years, this has been equalized. We say now the farmer puts up 50 percent of the money besides carrying out the practice. Opponents, of course, think the farmers should do it all. But I would remind you that India and China are in the shape they are because they misused their soil for centuries without putting anything back. So it is a national cause, not just the individual farmers.

*See p. 90 for the prepared statement of Mr. Kinkade.

Earl Butz says of the \$16 billion allotted to USDA (United States Department of Agriculture), in 1976, approximately two-thirds went to food and welfare programs, food stamps, school lunches, child welfare and nutrition, so forth. These programs should be funded through HEW, the Health, Education, and Welfare. But, the people in charge don't really care for the unfavorable publicity. It's better to say USDA spent all the money for farm programs.

Estimates show that terraces are the major cost items; approximately \$265 per acre. Although 57,000 miles of terraces have been built in Iowa, enough to stretch around the world twice, the job is only one-tenth complete.

I don't think people realize just how big a job it is to protect Iowa soil. More than one-third of Iowa's land is protected against soil erosion. Some is protected by grass and forest cover, some with conservation tillages, terraces, waterways, and so forth. But these practices are put on the line voluntarily by conservation-minded landowners, a great deal at their own expense. The future productivity of our land and the future quality of our water depends on a strong conservation program.

I hope you are convinced soil conservation is a must. If we must eat, and we must, the Government should encourage cost-share permanent types of conservation practices. I would recommend that we restore the Agriculture Conservation program to its original level authorized by Congress at \$500 million. In 1936 this was 6 percent of the budget. Today it is 0.14 of 1 percent. If Congress authorized at the 1936 level this would be \$20 billion.

In 1946, 50 percent of the farmers were able to participate in ACP. In 1974, less than 3 percent were able to participate. Cost-share requests for farmers are several times the available funds. We need to keep the control at the local level. Mr. Frick, of the USDA has tried to go against this directive, but the legislature and the Federal Government has been successful in implementing this, and it should be done again. Congress needs to do this for 1977 to keep the legislation back in control of the farm-elected county committee. Each country in the Nation has different needs, and they're the ones that know what it is.

These changes would enhance our conservation of our greatest natural resource—our soil and water. Some 4 billion tons of soil are washed away through erosion each year. Experts note that these are draining these resources faster than either India or China did. To insure that we greatly expand our food production in future years to feed the world and to save our balance of payments. Contribute to energy conservation by preventing waste of fertilizers in their humid areas.

I think I would like to make a comment or two—I hate to use up any more time—but there are some things that come to note. We have one-fourth of the prime land in the United States here in Iowa, and if we restored this to the \$500 million level in 1936, Iowa's share would be \$125 million a year, if we want to look at it from a prime land standpoint.

Where we're falling down is to put the practice into use. Farmers are interested in a total farm plan. They have to start someplace. They need a total farm plan, where am I going to start and where am I going to finish. Each step has to be taken.

We think tile drainage is something that is very expensive, and it is expensive. But, it's one of the first, in my book, to—maybe it's because I'm a tiler—but it's one of the first of conservation practices, because you have to, in many cases, put bottomland into full use and retire the sidehills. This is part of the farming program that has to be done.

And if you got sidehill seeps, you have to tile before you put the terraces in. You don't realize that just the cost of the terrace isn't the whole thing involved with conservation. I started tiling 30 years ago, and there is more tiling to be done now than when I started. That is the thing that some people don't quite understand.

A test was taken over in Ron Gahring's area over by Iowa City, when they were paying 50 percent of tile drainage costs. And that time they followed through and saw what the total costs—they did it on two or three farms—were as far as the Government was concerned, and they found out that in 3 years, that farmers paid back the money to the Government in increased taxes from the increased production off the land. They paid back the money that the Government paid them in 3 years.

We don't think of it that way, but this is actually what happened. It was quite interesting from my standpoint as a contractor to find out what actually did happen. So, it really doesn't cost us that much, to share conservation costs.

Well, I think maybe I better close.

Senator CLARK. We appreciate very much your statement. It's a good statement.

Let me just say in conclusion, because we're trying to get a plane at 1 o'clock to go on up and continue these hearings in Sioux City, that I want particularly to thank Leo Ryan, who lives here and couldn't be here today, for putting up with us and for preparing these hearings. And I know that there are a lot of other people that worked, as well, Matt and Mark Ryan, who are here, and I think Leo's Uncle, Eldon Renkin, who worked very hard to help set up these hearings. I know Emmet Ryan, who is, I think, a member of the board of supervisors, county board of supervisors here in Pottawattamie County. I know back here in the doorway a number of ladies who worked very hard, as well, Mrs. Holley, Mrs. Kern, and Mrs. Allen. So, we're very grateful to you.

Let me just conclude by saying I—and I want to mention and thank Tom Harkin, from the House Agriculture Committee, for attending these hearings.

Sometimes you wonder what good hearings are; what good it does to come out and talk about it and to tell us what the problems are and what's good and what's bad about the country or about agriculture problems. We think they can be very valuable.

We held hearings over in western Iowa—in fact, Tom, you were there—over there, I should say, in the Council Bluffs-Omaha area, about a year ago, on packer bonding after the American Beef Packers collapsed. We came out of those hearings and went back to Washington and wrote legislation in both Houses, and we passed it now, and we're working out the differences between the two versions.

I'm confident we'll have a bill on the President's desk before the end of this month, which will really do three things: it will establish

bonding for packers for the first time; it will establish prompt payment so that the farmers can be paid upon delivery, if they want, and in no case, no later than 1 day later; and it provides for a lien on the meat, so that the meat that goes into the packinghouse continues to belong to the farmer if bankruptcy occurs.

That was in no small part out of the field hearings that we held out here.

We did the same with regard to grain inspection. We held hearings out here. We have now passed a bill, a House bill and a Senate bill, on grain inspection, and although there are some differences between the two, I'm confident now that before the end of this month, we're going to have a bill to the President. So they can be important.

We thank you for the statements that we have had here today, and we look forward to meeting with you and working with you on this important topic in years and years into the future. Thank you very much.

[Whereupon at 12:45 p.m. the subcommittee recessed, to reconvene at 3 p.m. at the Homer Foster farm, Merville, Iowa.]

FEDERAL SOIL CONSERVATION COST-SHARING PROGRAM

TUESDAY, JULY 6, 1976

U.S. SENATE,
SUBCOMMITTEE ON ENVIRONMENT,
SOIL CONSERVATION, AND FORESTRY OF THE
COMMITTEE ON AGRICULTURE AND FORESTRY,
Moville, Iowa.

The subcommittee met at 2:55 p.m., at the Homer Foster farm located near Moville, Iowa. Hon. Dick Clark, presiding.

Present: Senator Clark.

Also present: Representative Bedell.

STATEMENT OF HON. DICK CLARK, A U.S. SENATOR FROM IOWA— Resumed

Senator CLARK. We are very pleased to have you here, and I now would like to officially open the hearing of the Senate Agriculture Committee.

I want to welcome all of you to this hearing. Today we are attempting to get a feel for how well our soil conservation programs are working. We want to be talking today to those who use the programs, and to those who administer the programs in the field—to farmers and to local and State representatives of the USDA, the Soil Conservation Service, and so forth.

Let me just say, briefly, that the reason that we decided to hold these hearings here, and the reason we decided to hold them on the subject of soil conservation, is because of the observation that generally this has been a subject which has been largely neglected in the last few years.

You know, we started soil conservation projects and cost sharing, in particular, about 4 years ago, and they have been very, very important to this country and to agriculture; but in the 4 years that I have been privileged to represent this State, I think we have never had a meeting, we've never had a discussion, and we've never had a hearing in the Senate Agriculture Committee on soil conservation.

And it is my view that it's time we begin to give this a good deal more emphasis than we have in the past; that we ought to look to see how well these programs are working; and that we ought to educate the rest of the country to the importance of soil conservation. So that is really the purpose here.

This is really the first day of hearings. We had hearings down in the Council Bluffs area this morning, and these will continue across the State in the months and years ahead, simply to try to give a greater

emphasis to the importance of soil conservation, for all of the reasons that I am sure all of you closest to the soil can understand best.

Now we are here because we are concerned about how we are using our resources, particularly our soil and water. I believe we have a sound soil conservation program, developed and refined over the past 40 years. And I believe that we can point to a good deal of progress that we have had in those programs over the years, both in terms of the investments made in structures and practices and in terms of the appreciation shared by farmers, civil servants, and others for the need to protect and preserve the irreplaceable soil and water resources that we have.

We saw a number of them in coming over here with Homer Foster—the terraces in this area, the terraces here on his place.

Now, in spite of this real and important progress, I am convinced that we are still not using our soil and water as wisely as we must, if we are to preserve for our children and grandchildren our fields and forests, so that they, too, can enjoy abundant food and fiber.

Our soil certainly continues to wash away faster than nature can rebuild it. We had testimony this morning that one-half of all the topsoil of this country—I should say of this State—has run off in the last 100 years. We have lost half of it.

Another person testified to the fact that for every bushel of corn that we produce we take away 2 bushels of topsoil.

We know how long it takes to reproduce topsoil. We had testimony from State conservation people today that—this morning—that in fact we are now only about one-third of the way toward the goals that we established 40 years ago in soil conservation. So you begin to see the importance and the priority that's necessary for these programs.

Today we have a national trade policy based on full production agriculture. The foreign exchange from agricultural sales is absolutely vital to the strength of the U.S. dollar. We exported almost enough agricultural products last year to pay for all of our increased costs in oil.

That is how important it is. It is the most important single commodity that this country exports. It is the most important because it is the largest.

Now we have got that kind of foreign trade policy; but, if we are going to continue that kind of all-out production, we have got to have a comparable soil conservation program. We have got to have some kind of comprehensive program there to match the foreign trade policies that we have, because if one gets out of kilter with the other, then we are going to suffer for it, and suffer for it very deeply.

Now, the Senate also has recently passed new legislation on water conservation, the so-called Land and Water Conservation Act of 1976, which requires that an appraisal of land and water resources be made every 5 years, and the findings be reported to Congress.

So this hearing also serves in part as the beginning of fulfilling newer requirements of the law in that respect.

Now, in general, the responses that we have gotten from soil conservation people across this State—I might say we started several weeks ago to contact all of the ASCS committee people, the committees all across the State, to ask them to give us two estimates: If they

had no budget constraints, how much money do you need in each of your counties and, second, if you have very tight budget constraints, as you clearly have now, how much money do you need to do the most basic thing in soil conservation?

Now, we don't have all the responses back yet. We hope to have them in before the record officially closes in 30 days.

But, in general, the responses that we have received, these show that there is a very urgent need and a substantial need above the current program levels that we are spending in soil conservation.

Nevertheless, the needs do not seem to be impossibly large. They are within our grasp and they are within our reach, if we are willing to give soil conservation a little higher priority in the scheme of things; and we think that is entirely proper.

Now the specific purpose of the hearing today is to listen to those who use our soil conservation programs and those who operate them here at the local level.

We have a schedule of persons who will appear, and we are asking you to limit your remarks to 6 minutes, because we do have a great number of people and we will have some questions as we go along.

I might say that although you filled out the cards over here—I think several people who came filled out the cards—we would like those of you to go back over to the table, who would like to testify—this is the card—and you can fill out the card.

Actually, if you have got a prepared statement, that's fine; if you just want to come up and talk for up to 6 minutes, that's fine. We want to hear from anybody that's prepared to talk, who has anything that they would like to contribute.

So, as we go along, if you would come on over to the table, as this gentleman is doing, and we can get your name so that we can just facilitate the progress here to hear all the testimony that anyone wishes to give.

And I think those who testify will want to fill out this card, so that we have it officially for the record. And, incidentally, if there are those of you here who are not prepared to testify today, who would like to submit a statement sometime in the next 30 days, we would be happy to have that as well; and it will become an official part of the record.

I think that concludes the remarks that I wanted to make. We are particularly delighted to have Congressman Berkley Bedell here. Berkley, of course, serves on the House Agriculture Committee.

We are very fortunate in this State in that we have got a Member of the Senate on the Agriculture Committee and in this district a Member of the House on the House Agriculture Committee.

And I know of his interest and his dedication to this subject, and I think it is altogether appropriate that we open by having Congressman Berkley Bedell testify first.

STATEMENT OF HON. BERKLEY BEDELL, A REPRESENTATIVE IN CONGRESS FROM THE SIXTH DISTRICT OF IOWA

MR. BEDELL. First of all, I would like to thank Senator Clark for coming here. I would like to commend you particularly for your concern over this particular matter.

As many of you know, I have agricultural advisory committees all across the district in every county. The last time that we were around for our meetings, one of the matters that we discussed at each meeting was the problem of loss of soil in the area. And it was just overwhelming, the attitude that existed among those members of our advisory committees, in that this is a serious problem; and that if we are going to continue with all-out production, we are indeed going to have to be concerned about doing something to maintain the productivity of this agricultural area, which is so tremendously important not only to us here but to our whole society.

There is no resource in America that is as important to us as our agricultural production.

I have a prepared statement that has some facts and figures that I would like to try to go through, if I might, and I will go on through this to give you some of these concerns that I have.

During the past 15 years, the Soil Conservation Service has estimated that about 4½ million acres in Iowa have been adequately treated against erosion. However, in that same time period, acreage, mainly in soybeans, has increased by nearly 5 million, and much of this new cropland is in sloping acres, which had previously been protected as pasture or hayland.

Iowa SCS estimates that such unprotected sloping land is losing 230 bushels of soil per acre per year, which, as Dick mentioned, is more than twice the rate of our corn production. In other words, on sloping cultivated land we lose two bushels of topsoil for every bushel of corn produced. SCS also estimates that on most of our sloping land we have only 6 to 8 inches remaining from an original 12 to 14 inches. At this rate, we could lose the rest in only two family generations of farming.

These and other facts and figures on soil loss in northwest Iowa and beyond are indicative of a clear and potentially dangerous course for the future well-being of American agriculture.

Unless we parallel the all-out production goals established by the administration with sincere efforts toward effective programs of conservation, we will continue to lose the soil from our land until we all too soon reach a time when the land is literally no longer able to provide us with the means for a high standard of living, or even to give us our food. I believe that it would be unwise for us not to heed the warning that the land is clearly giving to us.

In remarks made last November 6, Secretary of Agriculture Earl Butz said:

Our farm and ranch lands are the most valuable asset in this country. From them come the food on our tables and the shirts on our backs. They also provide us with our most important export commodities.

Recognizing this, he also said:

What is needed now is the determination of the men and women who use the land to apply conservation practices—minimizing tillage, stripcropping, contour plowing, terracing, range seeding, and the like.

At that time, I applauded the Secretary's call for a personal commitment from the farmers and ranchers to apply soil and water conservation practices. I had hoped that a call for a similar commitment from the Federal Government on behalf of this and future generations would be forthcoming. I have been greatly disappointed.

In December of last year, the House was forced to act against an administration proposed deferral of \$90 million out of a total of \$175

million in appropriated 1976 ACP funds. If allowed to stand, this would have meant a loss in cost-share funding for soil and water conservation practices of all but 38 percent of what Iowa received in the previous year of the ACP program.

Further disappointments awaited those of us who have for some time been troubled by a seeming lack of a sincere concern on the part of the administration in this area.

Again, in his 1977 budget message, the President proposed only \$90 million for ACP funding. The House Agriculture Committee, of which I am a member, recommended a figure of \$190 million to the House Committee on Appropriations.

To put that in perspective, that's about one-sixth of what we spent for one aircraft carrier or one submarine, one-sixth, in order to preserve this important soil that we have here.

Using Iowa as an example of a major agricultural State engaging in fence-row-to-fence-row crop production, it is estimated that only one-third of the land in the State is adequately protected against soil erosion.

Broken down into examples of types of conservation practices, this means that only one-tenth of the terraces have been installed, only one-third of the ponds have been constructed, only 6 million acres out of 20 million in the State have minimum crop residue on their surface to cut into soil loss, and only two-thirds of the drainage systems have been completed.

One of the most effective and widespread soil saving devices is terracing. It is also one of the most expensive.

If asked to assume the full financial burden himself, the facts show that the farmer will only reluctantly engage in such expensive conserving practices. In 1973, when the Federal Government impounded ACP cost-share funds, the erection of terraces in Iowa was cut by more than 50 percent.

If the farmer will accept only a part of the total burden for protection of the future of the land, then our society, which so richly benefits from the produce of that land, must contribute its fair share.

However, while there must be a commitment to do all that we possibly can to universally employ sound conservation measures, I think that we must also realize that this is a time when a multitude of programs are competing for a limited amount of Federal dollars. Thus each one of these precious dollars must be used with as little waste and to as much advantage as possible.

Acknowledging the value of efforts, such as the agricultural conservation program, there are certainly ways in which it could be made even more effective.

As an example, in 1975, 7,420 farms, representing 307,943 across the country, built terraces using \$5.1 million in Federal cost-share moneys. In Iowa, this Federal funding amounted to \$1.7 million.

Should a farmer remove these structures, he must then return the Federal share of the original cost. However, if the farm, with these improvements, should be sold and the owner, for whatever reason, decides to remove the terracing, he is allowed to do so without penalty, under current law.

I see this as a potential waste of money as well as conservation effort, and I am now looking into possible legislation to remedy a situation where a substantial investment is possibly jeopardized.

Some final statistics: It is my understanding that a 5 ton per acre per year soil loss is an acceptable amount for the soil to sustain continued growth. In the western rolling counties of Iowa, we are experiencing 20 to 25 tons per acre losses. This is unacceptable.

I believe that if we all are jointly enriched by the land, then it follows that we are jointly responsible—society through its government and the individual farmer—for genuinely seeking effective and efficient ways to directly confront a problem which can only worsen with neglect.

And I would like to enter into the record, Mr. Chairman, a statement that shows the soil loss in this area of Iowa, if I may.

Senator CLARK. Yes; you may.

[The soil loss information referred to by Congressman Bedell follows:]

EXHIBIT A
EXPECTED AVERAGE ANNUAL SOIL LOSS PER ACRE OF CROPLAND OF 22 COUNTIES IN
NORTHWEST IOWA

County	Tons/acre/year		Land adequately treated ^{1 2} (percent)
	Estimated soil loss per county (with treatment)	Estimated soil loss per county (without treatment)	
Lyon.....	9	16	66
Osceola.....	7	10	44
Dickinson.....	7	10	51
Emmet.....	7	10	53
Kossuth.....	6	10	36
Winnnebago.....	6	10	64
Sioux.....	12	18	33
O'Brien.....	10	16	51
Clay.....	7	12	80
Palo Alto.....	7	10	45
Plymouth.....	20	30	32
Cherokee.....	14	22	48
Buena Vista.....	7	10	52
Pocahontas.....	4	8	53
Humboldt.....	4	8	65
Webster.....	4	8	65
Calhoun.....	4	8	50
Sac.....	12	18	39
Ida.....	20	28	25
Woodbury.....	25	47	57
Monona.....	25	47	37
Crawford.....	20	30	53

¹ These figures include both erosion and drainage practices applied.
² Wind erosion not considered in these figures.

NOTES

The benefits of past and current soil conservation efforts are shown by comparing the second column with the first. These figures were prepared by the Soil Conservation Service at the request of Congressman Bedell and the information herein is an estimate based on the best information available.

According to SCS authorities the soil can sustain itself with 5 tons or less soil loss per acre per year. The figures in the first column show soil loss in some counties far in excess of what is acceptable. It documents the serious need for additional soil conservation treatment. The second column shows the extent of loss there would be without any soil conservation practices.

Sources.—From the SCS 99 report.

Mr. BEDELL. And I appreciate this opportunity to be with you, and I want to again commend you for focusing some attention on this very, very important issue to northwest Iowa.

Senator CLARK. Thank you, very much. We appreciate your testimony, and your work on the committee in that regard.

Now let me repeat again that those of you who wish to testify, whether you came prepared to testify or not, anybody that has anything to contribute or say, in terms of your own farm or any particu-

lar area, as commissioners of districts, of anything of that kind, we welcome your testimony here this afternoon.

The first person that we are going to hear from, appropriately enough, is J. Thomas Kenny. And you come right on up. We are going to use this chair here, I believe.

Mr. Kenny is with the Iowa State Soil Conservation Service. He is from route 1 in Akron, Iowa, and is a farmer.

So you just go right ahead and testify any way you think appropriate.

**STATEMENT OF J. THOMAS KENNY, CHAIRMAN, STATE SOIL
CONSERVATION COMMITTEE, AKRON, IOWA**

Mr. KENNY. Thank you, Senator Clark.

I am also happy to see Representative Bedell here and all the distinguished guests and friends of agriculture.

My name is Tom Kenny. I am a farmer from Akron, Iowa. I am a commissioner of Plymouth County's Soil Conservation District and chairman of the State Soil Conservation Committee.

I would like to thank you for the opportunity to express some of my thoughts on the subject of soil conservation programs.

There are two points about which I would like to testify: One being the public soil conservation cost-share assistance for protection of our most valuable and natural heritage; and the second pleading for more stability and continuity in the Federal Government programs designed to protect our soil.

Protecting our Nation's soil for future ages is everyone's responsibility in part. What I mean by this is, I think the landowners should have some cost-share assistance for permanent-type conservation practices which will save our soil for future generations, and not production practices which will benefit the landowner more than the public.

Many individuals for years have labeled Federal soil conservation cost-share moneys as "the rural Congressman's pork barrel," implying that taxpayers are not getting their money's worth from these expenditures. I think there has been some of this, but not at the magnitude suggested by some.

I believe that taxpayers have received their money's worth from these expenditures, insofar as this cost-share assistance has been used mostly for soil conservation practice and not production practices.

I believe we would receive a better favor from the public if the Federal cost-share moneys would be restricted to practices which are permanent. Now, I mean terraces, for instance, structures, and maybe grassed waterways used in conjunction with other soil conservation permanent practices, and so on.

Since 1973, we have had a State cost-share program in Iowa, administered by the Department of Soil Conservation, through which only permanent soil conservation practices have received public money. Accomplishments of this program have been impressive. This program has not been accused of "pork barrel" expenditures and has enjoyed bipartisan support in the Iowa Legislature.

For almost 40 years, both State and Federal Governments have had programs dealing directly with management of soil resources.

Throughout these years, the effectiveness of soil conservation programs has been partially affected by other agricultural programs and policies. During the 1970's, the influence of the Federal Government on agricultural resource management has been inconsistent and noncomplementary.

Government actions which encourage large production levels of feed grains and soybeans, or strive to improve water quality, should be coordinated with increased efforts to preserve our soil resources. These efforts should include financial and technical assistance for farm operators, support for research in soil conservation problem areas, and the establishment of Federal agriculture policies which consider resource as well as income and commodity problems.

I believe that this country can continue to feed its own people and export large quantities of food if we manage our soil resources wisely. Again, I would like to thank you for the opportunity to present this testimony.

Senator CLARK. Well, thank you. Let me ask you a couple of questions, because I think you've touched on the difficult areas that we're most interested in, in terms of whether we ought to have cost-sharing programs or not. I gather, generally, as far as permanent structures are concerned, permanent practices are concerned, that you strongly favor continued cost sharing in those areas; is that right?

Mr. KENNY. Yes, sir, in particular, terraces or something that is of permanent nature.

Senator CLARK. And why do you think they're important? I mean, that's the problem that we face in the Congress, and now we got the President and several Presidents back saying that farmers are going to do this whether we give cost sharing or not. What is your feeling about that? Do you think we would not have the county practice that we have now if we had no cost sharing?

Mr. KENNY. I think the cost is at such a level that the average farmer cannot stand this cost. I think that he should and can stand the cost of the production thing. In other words, if he wants to tile his land or something like that, drain off some, he can stand this. It improves his crop production and also improves the value of his land.

Terracing is something—a farmer, for instance, is not getting—when he gets 75 or presently 50 percent cost sharing, he's really not getting 50 percent cost sharing. For instance, you can't get a farm back into production in less than 5 years, even with fertilizer, manure or anything, into the original state of production.

I think the fact that keeping this ground protected and other parts of it protected, and keeping it for future generations so that our country and the world, really, will have adequate food, is everybody's responsibility.

Senator CLARK. You don't think it's just the farmer's responsibility?

Mr. KENNY. No; I really don't.

Senator CLARK. It's everybody's?

Mr. KENNY. Yes.

Senator CLARK. Now, how important is the cost sharing to soil conservation? Suppose the Congress took the advice of the administration and we appropriate no money at all. What would be the effect, in your judgment, in this State? You're the—give me your title, again.

Mr. KENNY. I'm chairman of the State Soil Conservation Committee.

Senator CLARK. So you speak for the whole soil conservation committee.

Mr. KENNY. We're very fortunate in the State of Iowa that we have legislators on our State level that can understand this and have appropriated \$4 million in our State for this.

Senator CLARK. And how important do you think it is in terms of the Federal money? What would happen if we did not have the cost sharing from a Federal level, what affect would that have on Iowa, in your judgment?

Mr. KENNY. I would say in the State of Iowa, it would better than cut the assistance in half. Better than that, really. And I think that we still have—well, for instance, in 1973, when Federal funds were tied up, someone mentioned that the cut—I don't remember what level he did say, Representative Bedell—but it would have been cut to a lot more lower figure than that if it wouldn't have been for our cost sharing, State cost sharing.

Senator CLARK. Now, the other questions I wanted to ask have to do with this difference or distinction that you make between permanent projects and cost sharing and those that are not. You are saying, particularly, as far as you are concerned, your association, that you feel that we ought to have cost sharing for permanent practices and not temporary practices.

Would you talk just a little about what the distinction is between those two and give us examples of both and why you think one ought to receive cost sharing and the other ought not.

Mr. KENNY. Well, for instance, I think, you know, like strip cropping, just contour farming, plowing or discing or harrowing of minimal tillage is very, very important. I think these are practices that are not costing the farmer a big cash outlet, and I think it's things that he can do on his own. He's got to do this regardless of how big the acres of corn he has. I don't think it's necessary that we use our moneys in this respect.

There's been a lot of money used for, say, for seeding, a lot of money used for different practices, maybe tiling. And I think in an area where tiling is a must, I think maybe we owe the people in this area an outlet or main, so we get a place to get rid of this water.

Senator CLARK. You think maybe that ought to be cost sharing?

Mr. KENNY. I think that in my estimation. Now, maybe somebody will say something against it, but I think this should be a permanent type.

Senator CLARK. But you say that normal kinds of tiling should not fall—

Mr. KENNY. I don't think the latter should fall under. I think this is production. This is my own, as I say, again.

Senator CLARK. What about limestone?

Mr. KENNY. I think this is a production thing.

Senator CLARK. OK. That's what I wanted. That's the kind of testimony we want to get, and I hope others here will grasp themselves to that.

Mr. KENNY. I enjoyed this, and I also want to express our regret that the director of our soil conservation could not be here. He has a statement submitted, and we're sorry he couldn't make it.

Senator CLARK. We're delighted to have you here. Thank you very much. We're going to hear next from an O'Brien County farmer, Wallace Simm. Wallace, how are you. Come right up. He farms near Paulena.

STATEMENT OF WALLACE SIMM, MEMBER, O'BRIEN COUNTY ASCS COMMITTEE, PAULENA, IOWA

MR. SIMM. I'm sure glad to be here. My name is Wallace Simm, a member of the O'Brien County ASCS Committee, and I would like to tell you why we, the O'Brien County ASC Committee, feel the definite need for a cost-sharing program to help prevent the loss of topsoil and extreme rate of runoff and erosion in our great country of ours.

First, we, as the elected members of O'Brien County, have always tried to administer and use any Government funds to the best of our ability. One of our greatest aims is to encourage tree planting in O'Brien County. A person wouldn't have to drive very far down the road to see the effects of what it's done this past spring and last winter with all the snow, because right close—well, O'Brien County was bad. We had a lot of groves just full of good topsoil, and you know when the rains come, you know where that goes, it goes right down the streams and the rivers.

Another priority is terracing. I am sure people know the importance of this practice; the most significant one being holding back of moisture so it will soak into the soil rather than just run down the slopes into the rivers.

We have another practice that has been high on our list, also, and this is sod waterways, and we have also encouraged a tile with this. Of course, this practice has been done more on the lowland. We're hoping that the upland will—can go along with this, so we can stop all this erosion. So we're trying to put this waterway into operation on the upland so that the benefits will help all practices.

Now comes one of the most expensive ventures—the installation of antipollution practices. This seems to be in the mind of every person today, and the farmers of America try to produce a huge quantity of meat for our society. It's used to—I mean, the consumers consume most of this each year. One can see how we have specialized in meat production.

Now, we ask ourselves, should we American farmers be expected to bear all the expense of this building of the holding pits, lagoon systems, and keep pollution out of our supply—water supply and streams?

We, the O'Brien County ASC Committee, honestly believe conservation programs can be administered better at the county level than by someone at the Washington level. It is hard to believe someone clear out on the east coast would know the needs of our county better than we. We are very much in favor of local control, and feel it should take an annual allotment of \$50,000 in our county to help keep and care for the minimum needs of conservation through the ACP program.

In conclusion—

Senator CLARK. What was that figure, again?

MR. SIMM. \$50,000. In conclusion, let the county committee make the decision as to how much money it will take to encourage the farmer

to install the conservation practices on his farm. After all, we're continually encouraged to get the most conservation work for the least amount of money.

On behalf of the other members of the committee, I would like to thank you for listening to our thoughts and beliefs. If there are any questions, we would be pleased to attempt to answer them.

Senator CLARK. Good. Well, let me just ask you two or three things. How do you—you know how the figure of \$50,000 a year was arrived at. You are talking about what you believe to be your needs for soil conservation practices in O'Brien County on a yearly basis; is that right?

Mr. SIMM. That is what we have worked with primarily, and we feel we're doing a good job. We could use more, a lot more. We've turned a lot of work down.

Senator CLARK. Could you use more effectively?

Mr. SIMM. Yes, we could use more effectively. But, to keep it at a minimum, that would be the very minimum amount we could do a good job, do it effectively.

Senator CLARK. Well, now, does—when you say \$50,000, where would most of that go, to terraces, or what would it go to?

Mr. SIMM. No. Terraces, sod waterways, and tree planting. And we haven't gone through much to these pollution control pits. We have helped out on a few of them, but that takes a lot of money, too.

Senator CLARK. Now, there was one thing you said that we really didn't have testimony on this morning, and I wanted you to talk a little more about it. You talked about local control and about the fact that you felt that what we needed really, was not people out on the east coast or in Government making decisions on soil conservation, but rather that we keep the control of these programs here locally established; is that right?

Mr. SIMM. Right.

Senator CLARK. Now, what is—isn't that really the role that the ASCS committee plays now? I mean, you decide—your committee decides which projects are going to be approved and disapproved?

Mr. SIMM. Yes, we do.

Senator CLARK. Why do you say that's important? I agree with you, but I'd like to have it in the record of your own judgment on why.

Mr. SIMM. We're in the county, spread out in the county, and we feel we're close. We know what should be done when one comes in and wants to have a practice. We feel that we know that land, we know what has to be done. We know what should be done to help conserve this land.

Senator CLARK. Just in terms of administration, how do you work with the district commissioner and what is your relationship? There's the ASCS committee on the one hand, the soil conservation district commissioners on the other.

Mr. SIMM. We work with them. They will go out and measure up what has to be done for terracing and sod waterways and this. We work with them.

Senator CLARK. Well, now, some of the people that testified this morning said that they felt very strongly that there was a good deal of land in their area that was under production that would have been much better unplowed, that there really was land under the pressure

of greater production that had been put into production that they really felt shouldn't have been.

Do you feel that's true around here?

Mr. SIMM. We have some, yes.

Senator CLARK. That would really have been better off not to be plowed.

Mr. SIMM. Very little in northwest Iowa, where we're at, but we do have some.

Senator CLARK. Just a couple of other questions. What is your belief—now, we heard testimony from Mr. Kenny a few minutes ago about permanent versus temporary cost sharing. This is one of the great controversies that's going on now all the time—do we need temporary or do we need cost sharing only on the permanent practices. This is one of the things we're most interested. What is your own feeling about that?

Mr. SIMM. Well, it runs both ways. I think they should be permanent and I think there should be—it shouldn't be just on one area. It has to be spread out.

Senator CLARK. What do you mean by that? I don't understand what you mean.

Mr. SIMM. Well, there's permanent ones that need help over a period of time, because it costs too much to do it all at one time. There is some little jobs that just got to be done to help the man above the watershed, to help him out.

Senator CLARK. Like what kind of practices?

Mr. SIMM. Well, there's some of these terraces where they run through—and waterways—where they run through about two sections, and you have to help out some of the fellows where it only runs through 3 or 4 acres, and he doesn't have the money to—

Senator CLARK. What kind of practices would that be? What kind of practices are you talking about?

Mr. SIMM. This would be waterway practices.

Senator CLARK. Isn't that a permanent structure?

Mr. SIMM. That's a permanent structure; yes.

Senator CLARK. But what about the nonpermanent structures—not structures, but temporary practices, what do you feel about these? Should we continue to cost share some of those? I'm thinking of lateral tiling, limestone, or something of that type.

Mr. SIMM. No. No.

Senator CLARK. You don't think so?

Mr. SIMM. No.

Senator CLARK. Why's that?

Mr. SIMM. The tile that goes with the waterways, yes, but not laterals. We're strong on putting in trees and groves and shrubbery, very much so.

Senator CLARK. Do you think we've failed in planting enough trees?

Mr. SIMM. I think we have. And we feel that in our committee, that this land is going to bigger farmers, and the farmsteads are getting littler, and all the buildings going down, and we just need more to stop the wind.

Senator CLARK. Have you had worse erosion—water erosion in the last 2 or 3 years than you've had before?

Mr. SIMM. Well, about 10 years ago it was real bad, the ditches were full, and then this spring there was a lot.

Senator CLARK. Why is that?

Mr. SIMM. Well, I think they plowed a little too much in the fall, and then they need the trees and stuff to stop the wind, too. Just a little too much stalk plowing this past fall.

Senator CLARK. Do you think that this ought to be discouraged?

Mr. SIMM. Really, it should be. But, you know how the farmer is, he's always wanting to get ready for the next spring, and when we have a good fall, it's hard to hold him down. But, it should be discouraged, to save our soil.

Senator CLARK. OK. Thank you very much. We appreciate having you here. Again, I say for those of you who would like to testify, that we've certainly got the time, I think, to take testimony from others. We'd be happy to have you just come over to the table and sign up.

We're going to hear next from T. Al Austin, from Story County. Come on forward. He's from the Iowa State University, professor of civil engineering, and we'll be particularly happy to hear your testimony Dr. Austin, anything you have to say.

Tell us a little, to begin with, about your own background, experience, and knowledge in this area.

STATEMENT OF DR. T. AL AUSTIN, REPRESENTING DR. MERWIN D. DOUGAL, DIRECTOR, IOWA STATE WATER RESOURCE RESEARCH INSTITUTE, AMES, IOWA

Dr. AUSTIN. Thank you for the opportunity to come and testify here in front of your hearing. I'm here representing Dr. Merwin D. Dougal, director of the Iowa State Water Resource Research Institute. He had a commitment today and could not make it and wanted me to come and make this statement.

A little bit of background, the Water Resources Institute was formed in 1964 and is a cooperating research institution on the Iowa State University campus involved with all phases of research involving water resources, including soil and water conservation practices.

We've cooperated with other research entities, such as the Home Economic Experiment Station, the Ag Experiment Station, the Engineering Research Institute, and others.

I have brought some copies of my statement here and also some publications that Dr. Dougal wanted to pass on which have a relationship to the soil and water conservation in the State of Iowa.

Senator CLARK. Are these publications that have resulted from the institute's work?

Dr. AUSTIN. These are all published by the Water Resources Institute over the last few years dealing with some of our work in this area.

Senator CLARK. Good.

Dr. AUSTIN. As you've heard, I'm sure, several people have testified today concerning the increase in agriculture production resulting from our increased export of agriculture commodities. Along with this increased production, I think we have to be concerned with the increase in soil loss that we have observed in some of our streams—particularly in western Iowa—in the last few years. This has probably resulted from lands being brought back into production that were put into retirement programs back in the mid-1950's when the crop surpluses were evident and the Federal Government had a retirement program.

Much of this hillier land, steeper land, has been brought back into production and has resulted in an increase in sediment yields in our streams.

At the present time, by volume, sediment would be our largest source of pollution in the State of Iowa; therefore, it presents a tremendous water quality problem to us.

Senator CLARK. You said sediment is our largest single contributor to water pollution in the State of Iowa?

Dr. AUSTIN. Yes; by volume.

Senator CLARK. By far?

Dr. AUSTIN. Sediment is the largest pollutant that we find in our streams. The last few years, accompanying the increase in the agriculture production, we also experienced some rare hydrologic events. We have had very wet springs with high intense rainfall, causing large runoff and sediment yields. In the late part of the year, we've had drought conditions occurring, lack of rainfall. These events of the last 2 or 3 years have also contributed to the increase in the sediment that we have seen carried in our streams.

In the fall of 1975 and early spring of this year, we became very concerned about municipal water supply reservoirs, particularly in southern and southwestern Iowa. They were being depleted at a very fast rate, and only the excess rainfalls that we had during April and May brought these back up to near normal levels and stabilized these reservoirs, at least temporarily alleviating the problem.

Senator CLARK. You couldn't get the institute to do something about getting some rain out here, could you?

Dr. AUSTIN. We're working on that.

Senator CLARK. You're working on that. Homer Foster asked me to put in a plug for that.

Dr. AUSTIN. It's getting drier this year as we move into late summer.

Senator CLARK. It is.

Dr. AUSTIN. Yes; just like the last 2 years. It would appear that we need to restudy the soil and water conservation program within a couple of frameworks. Particularly, what should be the role of the soil and water conservation program within the framework of a high level of crop production; how are we going to mesh these two somewhat conflicting goals—Federal goals.

Also, we need to be concerned with the goals established in the Environmental Policy Act of 1969 and its impact on the runoff and sediment problems of pollution. I'm sure you're aware of the national water quality commissioner's report and the tremendous cost associated with control of the sediment in pollution that they came up with.

We're also concerned about the soil and water conservation program that was instituted as a result of Public Law 566, the Watershed Protection Act. The administration, the Office of Management and Budget in particular, has been moving more toward a minimum cost sharing of 50 percent on all capital investments in these types of programs. We feel that this is somewhat arbitrary. As you have heard already, in some cases, maybe 100 percent of the cost should be borne by the local people; 100 percent on other cases should be Federal or some other combination.

Our research programs to date have shown, for instance, that in the State of Iowa, the maximum potential agriculture producers should be

required to pay for soil conservation practices is about 25 percent of the total cost, with 75 percent being required from other sources, if we're going to have mandatory controls. As a matter of fact, our Soil and Water Conservation Act, the one passed by the legislature in the State of Iowa, has this provision in it, that 75 percent of the funds would come from other sources, much of which, when the act was passed, would have come from the Federal Government through the rural environmental assistance program. As you are very well aware, these funds are no longer available. So this has hurt our implementation of the program of the soil and water conservation practices in the State.

I think it should be clear that we need participation from all levels of government; from the local people, the State, and the Federal, even though at this time I have no magic formula to tell in all cases what these percentages should be. But, I think there should be participation by all levels of government.

As I mentioned before, the Watershed Protection and Flood Prevention Act of 1954 established the watershed program for control of largely erosion and floods of watersheds of 250,000 acres or less. This has been primarily a flood prevention program. However, we're seeing that in many cases, particularly in southern and southwestern Iowa, that multiple-use concepts are important in these types of facilities. Water supply is becoming a more important concept in these flood control structures.

The Soil Conservation Service, as of January 19, 1976, had completed 397 small watershed projects. However, there are another 1,136 projects underway.

Senator CLARK. Give me those numbers, again.

Dr. AUSTIN. Completions—397 since the program began in 1954. There are 1,136 projects that were either in the planning stages or are awaiting construction funds. This creates an \$800 million backlog of funds for these watershed projects, which would be about a 10-year backlog at the current spending level.

Senator CLARK. If I might just interrupt you a second, you are talking there about national?

Dr. AUSTIN. Yes.

Senator CLARK. I might just add to that a little bit. We looked at the Indian Creek watershed project down around Council Bluffs this morning, and we talked with people at the Soil Conservation. In fact, many others. And it's my understanding that those figures that applied to Iowa, that there are something like 100 watershed projects that have been organized in the State, 16 of them only have been completed, and 24 more are on the way. I guess that adds up to about 40, and the other 60 are still not begun at all at this point.

So you can see the distance that we still have to go. It much reflects the kind of problems that we've got nationally.

Dr. AUSTIN. And if we look at the leadtime it takes, many of these projects take 20 years or longer to complete. If you look back at when they began, it takes something like 20 years to get one of these watersheds organized and the plans fully implemented.

Senator CLARK. I think that's just about right. I think about 20 years is about where you're at.

Dr. AUSTIN. It appears now that OMB is pressuring the SCS, Soil Conservation Service, to turn down any new projects in the near future

until a better balance can be obtained between the planning and the construction. The OMB has not had any funds in their budget requests for new planning starts in fiscal year 1977. As you see, there's just a tremendous backlog of watershed projects, and I think it does need for us to either reevaluate the watershed program or increase the implementation of the program. We've got the funds to start the planning and get it up to the point of implementation, but we can't carry it through.

Senator CLARK. It's your judgment, I gather, that if we follow the administration's recommendation here and don't appropriate any money, that these watersheds would never get beyond the planning point? Am I interpreting your comments correctly?

Dr. AUSTIN. Yes; and when we're talking about these kinds of projects, the cost is very substantial, in most cases. I think in Representative Bedell's statement, there was some talk about the cost, at least of terraces, but the soil conservation watershed projects are even more expensive.

Senator CLARK. They sure are.

Dr. AUSTIN. Also accompanying this, we're seeing more and more problems with water supply in southern and southwestern Iowa, in particular, and many of these areas without water sources are very poor quality or limited extent. One thing that the farmer can look to as an additional supply would be the possibility of a regional rural water system, using a Soil Conservation Service Watershed Act project as a source of supply. This would be, of course, on a cost-sharing basis where the cost of the water supply portion would be borne by the local people.

The problem with this is that justification of the project from the beginning must now be on the basis of flood control benefits. The project must meet the criteria of benefit-cost ratio greater than one for flood control in order for the Soil Conservation Service to consider water supply. As it stands now, water supply, as well as recreation and fish and wildlife propagation, are tagalong benefits, and it is our belief that consideration should be given to using these more as primary benefits rather than just add-on benefits.

I share the testimony of the last gentleman who talked about reforestation. I think this is a big need in Iowa. If anything, we're finding that our forestlands are dwindling. However, any type of production forestry in the State of Iowa would be a long-term investment since it takes more than one generation for a return on the investment. Currently, the funds for this type of a program are very limited, and I think some more emphasis should be placed on this type of a soil conservation program.

In conclusion, it appears that if we can modify and extend some of the previous policy acts passed by Congress and further work out some of the cost-sharing potentials and receive increased appropriations for these programs, then effective soil and water conservation practices could be implemented. A new look at the overall planning in soil and water conservation in context with the environmental quality improvement contemplated in the Water Quality Amendment of 1972 will do much in corollary measures to improve the agriculture role and the environment. Equal attention by Congress to some of the funding requirements will be required for a successful appropriation and a successful program.

I appreciate the opportunity to present this preliminary report. I have copies here for you. I appreciate this opportunity and would be willing to work with your committee in any way we can.

Senator CLARK. Well, that's good. We appreciate that. And the whole statement—I'm sure you didn't read the whole statement—but the whole statement will be put in the record.*

I want to talk with you a little more about the institute, itself. Frankly, I'm just getting into the subject of soil conservation and want to learn more about it and want to try to emphasize it over the next several years that I serve on this committee.

Can you tell us a little more about what the institute does? You're located, obviously, at Iowa State University. But, what do you do?

Dr. AUSTIN. We're located at Iowa State University. We are created by the Water Resources Act of 1964, a Federal act passed by Congress, which created in each of the 50 States a water resources institute at the land-grant college.

We get an annual appropriation which comes to us for research on water-related problems that are important to the State of Iowa. In addition, the Federal Government has about \$3 million of research moneys that we can draw upon.

Senator CLARK. Three million for the whole country?

Dr. AUSTIN. Yes; for the whole country. This is available on a matching grant type basis where we match \$1 of State money for every \$1 of Federal money. So, in essence, you can multiply that number by 2. It is still not a large amount of money.

We have a State advisory committee which is made up of State agency directors and many of the Federal agencies. This is kind of a governing board that gives us direction in our research efforts.

Senator CLARK. Can you describe for us one or two research projects that you've undertaken that would be beneficial to users out here on the ground?

Dr. AUSTIN. OK. We've got several people in the audience who have worked on some of our projects, but I have been involved primarily in the area of looking at the planning and design of the regional rural water systems where we have a centralized source of supply and water is piped throughout the county for the farmers' use. I have had two or three of these projects, and we're continuing our research work to try to improve the design of these facilities to make them more economical, and to look at the management of these facilities to try to minimize the cost of the department. This is only one of the projects. John Lafen, who is here in the audience, is working now on pesticide improvement and erosion.

Senator CLARK. What does that mean?

Dr. AUSTIN. Well, they are looking at the runoff that comes off the test plots and are trying to relate movements of pesticide and herbicide with the sediment yields and plant residue, the amount of crop residue left on the ground. This is an attempt to get a better understanding of the erosion process and the variables that affect it and what types of conservation practices might be more effective on the farm. Again, this is just one.

I also intended to give you a copy of our last annual report, which has a brief synopsis and summary on each of our research projects

*See p. 78 for the prepared statement of Dr. Dougal.

that we have had active during this last year, the research accomplishments. Of course, I'll just leave this with you.

We're an interdisciplinary group. We have got people involved in the institute from almost all disciplines; from the social scientist to the economist to the engineer to the agronomist; all people that are interested in water and water-related research work.

Senator CLARK. Let me just ask you a couple more questions. In viewing soil conservation—obviously you are interested in a broader aspect than that, you are interested in the whole water research and the whole water area—but as you view the programs that are in existence now in soil conservation, do you think we're on the right track, in terms of the practices that we have? I mean, is it simply a matter of needing more money to do what we know what we're doing right or is it a matter of finding new practices? In effect, are we using our money wisely, now? Is it simply a matter of more money or is it a matter of finding better practices or more effective practices than we have undertaken in the past and that we are undertaking now?

Dr. AUSTIN. I think, to a large extent, we have the technology to control the erosion fairly well.

We have a couple problems. One was alluded to earlier in a statement concerning what happens with conservation practices once the land is sold. I think we're seeing some changes in the conservation practices that were implemented back in the late 1950's to early 1960's. The terraces, for example, were not designed for the larger machinery that is being used now. It makes it more difficult to farm around terraces because of larger equipment, and since they were not designed this way, we're seeing some of the people going away from the terraces, and planting as if they had no terraces there.

So, we're losing some of this ground. I don't know whether we are gaining on the total problem. The last few years we've gone backwards, I think.

Senator CLARK. In soil conservation?

Dr. AUSTIN. Yes; we're seeing an increase in the sediment in our streams the past few years. We have taken a couple steps backwards and now we have to go forward.

Senator CLARK. Why is that? Why have we taken a couple steps backward? What happened, all-out production?

Dr. AUSTIN. I think all-out production is one of the big things. As I mentioned before in my statement, I think we've had some very severe conditions for erosion. We have had heavy intense rains coming early in the year when soil was unprotected by the crops. We're seeing land being brought into production because of the high export rates. We're seeing land being cleared that was timberland a few years ago. Grasslands are now being plowed up and put into row crops. I think all of these factors combined are cause for this increase in soil loss.

Senator CLARK. You know, members of the committee, when I first went out, used to complain, because they said that whenever you had set aside acres, farmers leave the worst land. So, we always planned for the worst land. In essence, that was a good idea—at least we were keeping it out of production.

Dr. AUSTIN. Probably, from the sediment standpoint, that was a good program, because it did take those steep lands, those lands that are not as productive, out of production and put them in a grassland, where the plant can hold the surface better.

Senator CLARK. I've often wondered—in fact, I guess, in 1972, when I was first running for office, we had some kind of a program we were trying to sell and never succeeded, in which we would try to—just as we have programs in ASCS—to get people, you know, what we call our farm programs, just some kind of a stimulus to take this land, which is really marginal land, and take out of crop production and put it into cow-calf operations, something of that kind.

We're at a point now where we have just plowed up so much, that it looks difficult for us to hang on to what we've got unless we are willing to make enormous investments in erosion control.

One last question: What do you think about the coordination between the several programs? I don't know whether you have studied that part of it, but one of the things that interests me is sort of a relationship of the ACP and the watershed programs, State programs, the Federal programs. We have got a lot of different people working out here. We've got soil conservation districts, we've got Soil Conservation Service, we've got the ASCS county committee deciding on the cost sharing, we've got the State program.

Do you see any—do you think those have been reasonably well coordinated as you have used them or have you looked at that aspect?

Dr. AUSTIN. I've really not had that much experience. Probably others can comment much better than I could on that. I think this is one of the things that I didn't read in my statement, concerning the need for this very close coordination. As you pointed out, there are many groups and programs for conservation practices, and we have to make sure we have a coordination between them, not only the Federal, but the State and local coordination.

In many ways, the soil conservation program with the committee beginning from the local participation on up is a fairly good model for looking at citizen participation, because it gets the people involved from the beginning concepts of the program.

Senator CLARK. Well, good. Your testimony has been excellent, Professor Austin, and we appreciate it and look forward to working with you.

Dr. AUSTIN. Thank you.

Senator CLARK. Thank you for bringing the materials. We're going to hear next from a farmer in Hancock County, Charles McLaughlin, rural route 2, Britt.

Mr. McLaughlin, we're pleased to have you here. You go ahead in any way you wish.

STATEMENT OF CHARLES T. McLAUGHLIN, DIRECTOR, IOWA ASSOCIATION OF SOIL CONSERVATION DISTRICT COMMISSIONERS, BRITT, IOWA

Mr. McLAUGHLIN. Thank you.

I am Charles T. McLaughlin, a dairy farmer and a soil conservation district commissioner for the Hancock district of Iowa. As a director of the Iowa Association of Soil Conservation District Commissioners, I represent a 12-county region in north-central Iowa, and I am secretary of the State association.

I wish to express my appreciation to you, Senator Clark, and to the other members of your Committee on Agriculture and Forestry, for

your concern for this vital resource, the soil, upon which we all depend for survival. I thank you for the privilege of testifying here, today.

Although we here in Iowa are fortunate in having a State cost-share program in addition to the technical program of the Federal Soil Conservation Service, and in addition to the moneys disbursed through the ASCS program, I fear that our efforts have been woefully inadequate. I say this in view of the policy of the USDA to promote all-out production, and in sober anticipation of a world population forecast of 7 billion within 25 years.

I am dismayed by the Government's policy which encourages the plowing of diverted areas without assurance of adequate soil conserving measures. In many areas, the resultant devastation has already curtailed our ability to feed future generations.

It might be well if we could make an all-out effort to conserve our soil, just as we made an all-out effort to go to the Moon. However, I am painfully aware of factors which doom this dream: First, public awareness. Second, technical skills. Third, money. Fourth, equipment.

Briefly, and in reverse order, these factors constrain our effort thus: Equipment can be owned, maintained, and operated by contractors if they are assured of a long range permanent program which will justify their investment.

Availability of technical staff is a different question. I have been appalled that as a deliberate Federal policy, our technical staff has been drastically cut at a time when our soil resources are ominously endangered. It would be my hope that this policy will be reversed, and that the Soil Conservation Service can be assured that it may develop technical help as it is needed, for a sustained and progressive program.

Money for funding is, of course, dependent upon both economic factors and public awareness. I am fully aware that economic conditions have been less than optimum, but I am also aware that for other kinds of defense, the budget has provided apparently unlimited sums.

Definition of priorities brings us again to the basic essential of public awareness. Urban consumers often delude themselves that soil conservation is the responsibility of the individual farmer. This is unrealistic. Many farmers have made a significant and sacrificial contribution to the conservation of soil and water. In Iowa, during this past year, farmers have more than matched the combined State and Federal funds with their own money, in order to protect and finance the productivity—and enhance the productivity of Iowa's soil as a heritage for future generations.

However, each farmer has his own inevitable, fixed expenses which he must meet in order to stay in business. Since the benefits from most essential long-range kinds of soil conservation will accrue to future generations rather than to the present farm operator, the assignment of public money to these investments is valid.

Conditioning the public to this need requires an intensive education program. Serving as chairman of the Education Committee of Iowa Association of Soil Conservation Districts has convinced me of the urgency of this education effort. No aspect of our program is more essential to the fulfillment of our goals.

Not only must schoolchildren be taught the fundamental dependence of their own lives upon our resources of soil and water, but the voting public must be widely informed concerning the life and death decisions which they and their representatives are facing. The man-

agement of soil and water resources is as crucial to the future of this Nation and the quality of life here as are our costly defense and welfare programs.

I am concerned that the district administration of the soil conservation program is requisite to its success. The locally elected, unpaid commissioners, or supervisors or directors as other States may call them, have done a wonderful, even heroic, job of allocating available funds, selecting the permanent practices most effective for the locality. They have been uniquely efficient in converting available cost-share money into permanent practices on the land. Iowa's entire additional administrative cost attributed to cost share has been less than the salaries of two persons.

Furthermore, I believe that long-term agreements are the most effective administrative tool now in use. LTAs provide for a total conservation plan on an individual farm. Also, the plan projects its implementation on a schedule which makes the best use of the farmer's time, money, and facilities. This seems to me to provide the maximum amount of conservation with the minimum of public funds.

At present LTAs are not popular with some ASC committees, who must budget the funds. The entire allocation for a long-term agreement must be entered at one time, and only a few LTAs can consume a county's entire yearly allotment of funds. It would surely be advantageous to design a permanent program, with funds provided as needed rather than held in escrow for projected use.

In north-central Iowa, we have an additional aspect of soil and water management which must similarly affect other areas of excellent soil within the Nation. Our drainage outlets were designed for a horse-powered, general agriculture of 50 to 75 years ago, and are totally inadequate to current agricultural practice.

Redesigning these drainage outlets will now be a very costly undertaking; not possible under existing laws and financial structure. Income not realized, due to inadequate drainage outlets, is estimated at over \$200 million yearly in this 23-county area. We know from experience that drainage pays. We have the motivation and the technical skill to accomplish this. We now require modernization of financial and legal means to make it feasible.

I am not proposing that drainage outlet improvement be incorporated into the soil conservation program, but it is a vital issue, bearing upon the broad impact of soil and water management. It merits public attention. Attached to my testimony is an analysis of relevant facts which I prepared last year.

I believe that I, as a landowner and a citizen, and that you, as lawmakers and as citizens, will be judged by posterity according to our conservation ethic, more than upon any other criterion.

Senator CLARK. Good statement. I wanted to do, before we go further, talk a little more about this drainage outlets improvement. You say, given the present laws—the present funding, it's just not possible to update those improvements. Could you expand a little on that. Do you think we need legislation in that area, and if so, what kind? You mentioned, maybe you recall, in your statement, many of these drainage outlets were designed for 60 or 70 years ago.

Mr. McLAUGHLIN. Well, at the time they were designed, they were quite—in many cases, very adequate, because we had horses to feed and

we had general agriculture where there were cows. Some of the lowland which was too wet part of the year was excellent pasture in the time of the year when some of the other ground was too dry. Now that we're into general agriculture and all-out production, many farmers want to farm all of this land.

For example, the drainage district in which I live was designed for 40,000 acres. The outlet was designed for 40,000 acres. There is now 85,000 acres draining into it, and there is no way that it can handle that quantity of water with the speed at which it's required to go.

Senator CLARK. Now, specifically, what do we need there? What would we do? What would we change?

Mr. McLAUGHLIN. This is probably another type of watershed program which has not been popular, because it was drainage; also, a few years ago there was too much production and policymakers said: "Well, let's forget about it, we've got too much already, let's not bring more land into production."

But, the unfortunate part about it is, that this poorly drained land is some of the best soil that we have and some of the least subject to erosion. It could be some of the most productive, if it were probably used by providing outlets. And here, again, I'm not talking about the tiling on the individual farm, I'm talking about the big outlets, the 36- and 40-inch tile that is almost prohibitive for even groups of farmers to buy, anymore. Also, I'm talking about river basins which have some other matters such as environmental impact statements to contend with. Although these factors are costly, we do have the technology to match the need.

Senator CLARK. What should the Federal Government do in regard to those outlets?

Mr. McLAUGHLIN. I think, probably, the watershed program could be expanded to include this type of thing, very well, very easily. In fact, I think that suitable machinery is probably there, but the practice of usage is not there.

Senator CLARK. Well, now, I was interested in the fact that you said we don't give very high priorities to some of the soil conservation practices by comparison with defense spending and some other things that you mentioned. That made me think in my own mind that this morning we had a witness representing the State, the Soil Conservation Service, that said that their estimate was that we need \$2 billion to do all the work—at least this is the way I recall his testimony—to do all the work that remains to be done in this State. He said \$1.6 billion of it ought to be spent on terracing. Two billion dollars.

We're in the process now of—I just noticed in the last Defense budget—of undertaking construction of 10 new Trident submarines. Each Trident submarine costs \$1.5 billion. So, we're talking about priorities here. You could complete—you could virtually complete all the terracing on all of Iowa's projects that we have any feel for a need in soil conservation for the price of one submarine, and you wonder in terms of the return on the dollar, if that wouldn't be a pretty good investment.

Mr. McLAUGHLIN. I think it would be an excellent investment. You asked the question a while ago about this matter of, "do you think the public should be involved?"

Senator CLARK. Yes.

Mr. McLAUGHLIN. There is a financial statement that I have seen made, the Extension Service has used it and some other people, that if a farmer were to borrow money to build a terrace at the present time, he probably could farm that land for 30 years and not see too much decrease in income without building it. And, after all, this is a capitalistic society in which we're out to make a profit.

But, if he borrows \$100 for the terrace, in 30 year's time at 8-percent discount, that \$100 would be worth about \$6. On the other hand, if he pays the interest on it, it will have cost him a little over \$1,006. So, actually, on that basis, he cannot tie up his funds in a long-range program from which he sees little income. He probably takes a decrease in income the first 5 years, and then not a greater income even into the later years.

Senator CLARK. You're a strong supporter of cost sharing?

Mr. McLAUGHLIN. I think that cost sharing is the only way we're going to get the job done if we are to protect the rights of future generations. I personally think that conservation should be paid for by those who benefit from it. This is the only way that I see the future generations can help pay for the benefit they are going to receive.

Senator CLARK. Now, one technical question. We've been looking pretty hard the last several weeks at this limit of \$2,500. That hasn't been increased in a good long time. Do you think that needs to be increased or would you prefer to see it left where it is and spread around more?

Mr. McLAUGHLIN. I think the limit of \$2,500, if we are to receive funds enough to proceed with the speed we need to, would be quite a limiting factor. It is still a limiting factor on many of the jobs. Our farms are getting bigger.

We have people who are willing to proceed to meet conservation standards, but they don't wish to do it on this piecemeal fashion. It's cheaper to get a big job done with a contractor while you have the machine there, and can get a lump estimate on it rather than having him return three or four times.

Senator CLARK. One last question, or the question that I asked the last witness. Do you feel that there is a proper coordination now between these various levels of government and various areas of government that we're talking about, the soil conservation districts, ASCS committee, ASCS, generally, Soil Conservation Service, the State conservancy program, do you see that as being fairly well coordinated or do you think there is room for improvement there, and if so, how?

Mr. McLAUGHLIN. In the 12 counties in my region, I see various stages of cooperation involved, some of them excellent. I have been in on meetings where all of the people involved, extension service, ASCS, SCS, the technical people, even the conference committee and supervisors from the county, have sat down together and said, now, what are our needs, what are our priorities, what shall we do with what funds we have available and how should be handle it? They worked the alternatives out together and got guidelines set up as to how they're going to do it and follow through.

I realize that also in some other situations, there are some personality conflicts and a certain amount of jealousy. There are two sets of funds involved, and this, of course, could cause problems. But, in most cases, it has worked out quite well, in my estimation.

Senator CLARK. Good. You've given us some very good testimony, Mr. McLaughlin, and we appreciate it.

Mr. McLAUGHLIN. Thank you very much. If there's any way we can help out, we would be glad to.

Senator CLARK. Thank you very much. We'll be in touch with you, I'm sure.

Also from Story County, Don Erbach, who is also at Ames at Iowa State University, I think, agriculture engineer, and in the Agriculture Research Service with USDA, if I'm accurate.

STATEMENT OF DON ERBACH, IOWA STATE UNIVERSITY, AMES, IOWA

Mr. ERBACH. Thank you very much, Senator Clark.

Conservation of our soil resources is necessary to satisfy future agricultural production needs. There is considerable evidence to show that plant residue left on the soil surface using methods described as conservation tillage systems is a very effective way of controlling erosion of soil by both wind and water.

The majority of the two main crops grown in Iowa are produced with conventional clean tilled systems using the moldboard plow. This leaves the soil very susceptible to erosion for several months each year. Also, those tillage systems that do not use the moldboard plow often include other tillage operations that reduce surface plant residue to levels that are not effective for erosion control. Though the use of conservation tillage in the Corn Belt is increasing, tradition, lack of equipment, and general uncertainty about pest control, production, and profit are among the reasons for slow adoption of conservation tillage.

I've been involved in tillage research with the Agriculture Research Service in cooperation with Iowa State University at Ames. The major objective of my research is to develop tillage equipment and systems to improve erosion control, reduce energy inputs, and increase production.

An evaluation of several tillage systems for continuous corn production was made from 1971 to 1975. Inputs and several soil conditions and plant growth variables were recorded. The yield results, which, of course, are very important, are as follows: The conventional fall moldboard plowed system totaled 141 bushels per acre. Yields of all the other systems were lower, ranging from 2 percent with the till plant system down to 11 percent with the no tillage system. Yields obtained at other locations with different soil and climatic conditions may differ, but in a large portion of the Corn Belt yields tend to decrease as the amount of plant residue on the soil surface increases.

Even though in the evaluation at Ames a 9-percent reduction was needed for statistical significance, it is awfully hard to sell a system to a farmer that shows a tendency toward reduced yields. Because the cost, both to the farmer and to society, of the loss of a ton of soil has not been adequately estimated, it is difficult to make satisfactory economic comparisons of these different tillage systems.

A large portion of the yield reductions found with conservation tillage appear to be caused by the lag in reduced stand establishment. Where plants were thinned to stand after emergence, the tillage system had little effect on yield. Cooler, wetter soil conditions and nonuniform placement of seeds in the soil seemed to be the primary causes of this

poor emergence. Based on these results, an effort has been begun to develop equipment for planting corn and soybeans through surface plant residue. Also, corn genotypes selected for cold hardiness are being selected and have been found to have a potential for increased emergence with conservation tillage.

Because the environment with conservation tillage differs from that with conventional tillage, concern has been expressed about potential pest control problems with the conservation tillage system. Thus far, no significant weed problems have developed in our conservation tillage study. The predominant weed species present, however, did depend on the tillage system and the weed control program used.

To reduce the amounts of herbicide needed for weed control, the affect of tillage systems on the distribution of germinable weed seeds in the soil must be determined and herbicide application techniques with improved efficiency must be developed. Evidence of increased infestation of corn leaf diseases with increased amounts of surface plant residue and an increased number of plant parasitic nematodes with reduced tillage have been found by Iowa State University scientists.

This year for the first time a series tillage oriented insect infestation was observed. Black cut worm feeding on corn planted in soybean residue was severe. Over 90 percent of the plants suffered feeding damage in the no tillage and till plant systems, but feeding was very light in systems tilled before planting, probably about 1 or 2 percent.

Before pests can be adequately controlled with conservation tilled crops, it is necessary to learn more about the problems associated with and the control measures compatible with conservation tillage. The erosion control benefits of conservation tillage are well documented, but the successful implementation of conservation tillage on a scale sufficient to have a significant impact on reducing soil erosion in the Corn Belt requires the development of equipment, varieties, pest control programs, and management techniques that will assure high yields and adequate profits when crops are grown with plant residue on the soil surface.

Senator CLARK. Thank you very much. I'm interested in this whole issue of minimum tillage. Now, as I understood your testimony, you said that, well, clearly, that the use of the moldboard plow is more destructive in terms of soil conservation, in terms of erosion, but also I understood you also, you do pay a certain economic cost for not using it, or am I misinterpreting your testimony?

Mr. ERBACH. That appears to be true in a good portion of the Corn Belt. In a lot of areas, they have found that when you leave the plant residue on the surface and you don't plow, your yields tend to be somewhat reduced. And this is hard to balance off from the cost of the soil loss, because we really don't have a good value to place on the soil.

Senator CLARK. So the long-term benefits may be in the direction of minimum tillage, but perhaps the 1-year or 2-year benefits, you pay the price.

Mr. ERBACH. I think so.

Senator CLARK. When yields are reduced as a result of this, are costs reduced to some degree, too, when we're talking about minimum tillage?

Mr. ERBACH. Well, they can be. There is a possibility of having reduced cost, especially for equipment and for labor requirements in the

field, but it is possible that the increased costs of pesticides may balance this off and put you back to the same place.

Senator CLARK. Offset that. Well, now, is it possible that the Agriculture Research Service will be able to solve some of these problems and make it more profitable to use the conservation tillage practices in the future?

Mr. ERBACH. I think there's a good chance that some of these problems will be solved. There is a good chance that conservation tillage will become more profitable if we just use these conservation tillage practices, develop equipment that will operate with the plant residue on the surface, and learn a little bit about the control of pests under this different environment. Because we have a changed soil condition we have to learn to understand it and to work with it.

Senator CLARK. Yes.

Mr. ERBACH. We're very familiar with what goes on in the clean tilled systems. We kind of recognize when a problem is coming and kind of know what we can do to handle it. It's just a matter of time and work to learn some of these same things about conservation tillage systems.

Now, it may be such a thing that some problems may arise that are very difficult to solve. But I think we'll progress a long way down that road as work continues in this area.

Senator CLARK. Now, let me ask you a couple of questions. If you were a farmer and you were farming out here, what would you use?

Mr. ERBACH. If I was a farmer and I was farming right now, I think there's a good chance I would be hard pressed to get very far away from that plowing system. However, there is one system that has worked quite well in our studies. It really is the only system, though, that has been developed to operate as a system, and that's the buffalo till plant system.

Senator CLARK. The what?

Mr. ERBACH. The buffalo till plant system. I believe this works quite well. A lot of other systems can be made to work once the equipment is properly designed and management of the systems is understood.

Senator CLARK. Good. Thank you very much.

We're going to hear from Lyle Scheelhaase from here in Woodbury County; in fact, from here in Merville, and also a State representative. Come right on up, Lyle, and proceed in any way you think appropriate. It's good to have you here.

STATEMENT OF HON. LYLE SCHEELHAASE, IOWA STATE REPRESENTATIVE, MERVILLE, IOWA

Mr. SCHEELHAASE. Thank you, Senator Clark. Thank you for the opportunity to testify today.

I do have a prepared statement that I would like to go through a little bit.

Senator CLARK. Fine.

Mr. SCHEELHAASE. I have something that some of the others have not touched on that is a concern to me.

The vital importance of conservation for Iowa and indeed for all America and the world cannot be overemphasized. We in the Midwest have been bountifully blessed with rich soil and generous streams. In

turn, we have an obligation to wisely use and preserve these resources to assure their continued benefit for future generations.

America's leaders discuss the importance of world peace, the needs for educational excellence, the struggle for social justice. These are worthy and significant goals. But if we fail to maintain the quality of the soil and water which sustain and nourish our people in their very basic need to food, we will be building an empty future.

Both the State and Federal Governments have in the past recognized the importance of conservation efforts and have given their support to these practices. Often the support has not been adequate to meet the need, but at least the effort has been made. I strongly urge that these efforts be continued and strengthened. With your permission, I would like to take a few minutes to cite several specific needs which point up the importance of maintaining viable conservation endeavors.

New Federal bridge requirements have been handed down through the Department of Transportation. Here in Woodbury County alone, these requirements indicate that a number of our bridges are below acceptable standards. A great deal of money will be necessary to make repairs, and in some cases, to build replacement structures.

However, if the proper conservation practices were implemented throughout the county, some of these bridges would not even be necessary. Instead, conservation structures should be built to properly direct streams and hold the soil. In doing so, we could avoid the need for bridges in a number of cases, and probably save the taxpayers a significant amount of money in the process.

Down in Monona County, farmers have a real need for land leveling. It would provide a good deal of valuable help in solving the problems of water drainage, as well as leading the way toward the type of irrigation which is important there to bring the land to its full productive potential.

A new study by Iowa State University has revealed that soil erosion in the 10 western Iowa counties has increased 22 percent as a result of recent "fence-row-to-fence-row" planting practices.

Senator CLARK. Twenty-two percent?

Mr. SCHEELHAASE. Twenty-two percent.

Senator CLARK. In how many counties.

Mr. SCHEELHAASE. In the 10 western counties in Iowa.

Senator CLARK. Ten western counties.

Mr. SCHEELHAASE. Yes, sir. Soil losses as high as 60 tons per acre were noted on some farms. Certainly this kind of depletion in valuable Iowa topsoil indicates how imperative it is for farmers to press forward with more terracing construction and other conservation means.

One of the most serious conservation problems in this area involves a concern which led me to introduce a special resolution during this year's session of the Iowa General Assembly. As a result of work which the Army Corps of Engineers has performed on the Missouri River, it is now straighter and has a narrower channel than in the past. The river's volume of flow has also increased with the jump in discharge levels from dams upstream in South Dakota. The river, therefore, is scouring its own bottom at a rapid rate, washing evermore soil southward and gradually lowering the water depth in the process.

As the water depth recedes, it is approaching the point where its

level will drop below the layer of soil in adjoining farmland and down into the layer of gravel which lies beneath the soil. When this happens, subsoil moisture in this area will drain out into the river much more quickly, thereby adding considerably to the moisture shortage problems which already plague our region at frequent intervals.

Granting the seriousness of these problems and the need for conservation practices to provide solutions, you may reasonably ask why landowners themselves do not act on their own. In many cases, they do.

But the plain fact is that conservation activities can be quite expensive, especially where structures are involved. With the sort of drought conditions and depressed cattle prices which western Iowa farmers have faced in recent years, and, unfortunately, seem likely to face again, it is impossible for them to spend the giant sums of money required for conservation. They are willing to give their share, but are simply not able to pick up the full tab. And, when viewed objectively, conservation efforts benefit society as a whole, so it is eminently fair for the costs to be shared by society as a whole through our tax dollars.

As I proposed earlier this year in a resolution which was adopted by the Iowa House of Representatives, the loss or reduction of Federal soil conservation funds can only result in erosion of rich farm soil, decrease in yields from farmland, hardship for American farmers, and eventual repercussions throughout the entire American economy.

As a result of this, I made a study and was asked by Iowa Public Service Co., to visit the Fort Neal station, and all of this has to do with the conservation, but the Missouri River is scouring the bottom of a river, and they're in the process now of building a new plant over there, plant 4, and they dropped the inlet tube to that 14 feet below the level that they thought would be necessary when they started construction on that plant at an additional cost of \$2 million.

In the other plants that they have over there, they have approximately \$200 million invested, and at the rate the river is dropping, they are going to be required to spend somewhere between \$10 and \$14 million to lower the tubes to adequately get the water through their cooling systems.

Every gallon of water that we dump into the Missouri River above Sioux City contributes to the problem and of the flow and of the velocity and the volume of water that is carried down through there. But this also presents a problem to the farmers of Monona County and southern Woodbury County, because as that river drops, so does the water level that runs back into their lands, and their water table is dropping.

I had hoped that there would be some of the fellows that were down there that would be able to testify here this afternoon, but I think probably most of them have been involved with something that took their time today. But, we do have a serious problem down there, and any consideration that you can give toward our problem, I would greatly appreciate.

Senator CLARK. I appreciate your statement very much, and I think you're right in saying that the soil conservation is everybody's responsibility. Everybody benefits from it, and I think everybody ought to be willing to share in the costs of it.

I do want to compliment you and the Iowa Legislature, generally, on the kinds of legislation you passed. Iowa is the only State in the

Union, according to my information, that provides cost sharing at a State level, State government, to farmers for soil conservation purposes. I think that means that we're at least well ahead of the rest of the States in the Union in that respect.

And we know how far we've got to go yet, and we know the Federal Government has certainly not in the past and not likely in the future to provide all the funds that are going to be needed and that are—that could be wisely spent. I just hope that you'll continue your work there in the legislature and that the legislature will continue to do the kind of job that is going to be needed in a cooperative effort, both at the local levels, the soil conservation districts, and at the State level and at the Federal level. We appreciate it.

Mr. SCHEELHAASE. I would like to make one more comment, Senator Clark. Earlier you talked about local control of the funds that were needed. In the State of Iowa, we have so many variations of soils and types of practices needed, and that's why local control is so necessary, because what we need in northern Woodbury County is different than in southern Woodbury County, and local control in the use of those dollars, I think, have been very wisely spent and handled by the local committees, and I recommend that we keep it that way.

Senator CLARK. Now, I think that is exactly right. We're at a point where the variation in soils and the variation in practices are so great, even within one State—as you say, within one county—but certainly within one State. I've been trying to learn more about soil conservation in different parts of the State. I've just gone out and looked at practices, and it varies tremendously, the types of soil.

In fact, Homer Foster and I were saying as we came up here through this bottom land, that just the difference in soil that you see just driving across that area, difference in productive capacity and so forth. It is enormous, and I think it's very important that we do keep the local control, the soil conservation commissioners, ASCS committeemen, to make these decisions. You are absolutely right.

Mr. SCHEELHAASE. Thank you.

Senator CLARK. Now, the next witness is John Laflen, who is an agricultural engineer at Iowa State University. We're glad to have you here.

**STATEMENT OF JOHN M. LAFLEN, AGRICULTURAL ENGINEER,
AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF
AGRICULTURE, AMES, IOWA**

Mr. LAFLEN. Thank you, Senator Clark.

I have prepared a statement, and I'll just summarize that briefly.

Senator CLARK. Fine. We'll make your whole statement a part of the record. Go right ahead.*

Mr. LAFLEN. My research duty is to provide new and improved technology for controlling erosion of croplands. I am concerned, because erosion is a problem. We've lost nearly 35 million acres of cropland in the United States according to data published in 1965.

Senator CLARK. Thirty-five million acres?

Mr. LAFLEN. Thirty-five million acres. I'm concerned because of the loss of this valuable resource.

*See p. 82 for the prepared statement of Mr. Laflen.

Water conservation was mentioned briefly, and I'm not going to address that subject. But when you have a drought, water conservation becomes very important. We have research underway in Iowa looking at improved varieties that can withdraw more water for crop use.

We have practices that now control erosion on any cropland. These can be rotations, contouring, terraces, meadow, conservation tillage; applied either singly or in combination.

Man doesn't have a better practice for controlling erosion than a meadow. A meadow is the best practice that we have for controlling erosion.

Conservation tillage, according to recent reports will be used on 80 percent of U.S. cropland, 50 percent of U.S. cropland will be farmed without tillage. This could boost harvested acreage in the United States by 20 million acres; production would be increased 5 percent.

Soil loss from modern terrace systems is quite low. We have research data that indicates—at least for four systems that we have looked at in Iowa—that we've reduced soil loss to less than 800 pounds per acre per year, or less than half a ton per acre per year. This is a reduction in soil loss of 95 percent.

On some lands, particularly in this area, terracing or changing land use are about the only practices that are suitable. There are some disadvantages to terraces that I would like to mention. One is that it does take a very long period to implement terraces on a large scale in an area. It would require an increase in the construction industry. After terraces are built—at least the kind of terraces we're using now—soil is trapped above the terraces creating a continuous maintenance problem over the long run.

Also, terraces do overtop. They are designed to store only so much water, and when you have certain severe storms, those terraces will overtop. It is expensive to do the reconstruction.

Rotations and contouring don't fit the modern farming technology very well. Conservation tillage is a conservation system that could be implemented fairly quickly. This farmer has corn planters that could be used in conservation tillage, and perhaps already are. This planter could also be used in a no-till system.

Every farmer in Iowa is going to change his corn planter within a decade or so, and in that time, he could change to conservation tillage, and this would eliminate a lot of problems on a lot of our land. Maybe not so much in this area or in some of the steeper areas south of us, but in much of Iowa, conservation tillage would be very important.

Dr. Erbach has alluded to some of the problems of conservation tillage. We have formed at Iowa State University a conservation tillage research group, a State and Federal research team, to look at crop production under conservation tillage. We have 13 scientists involved. We're preparing to do this research now, and some of it is underway. We have people that would be looking at weed control, diseases, insects, soil fertility problems—in fact, just a week ago I visited with an agronomist about some cooperative research—machinery to plant and cultivate. Economics are being studied or will be studied. Research in conjunction with a chemist will be conducted this summer that will examine water quality as related to placement of nutrients and pesticides.

I want to emphasize that research alone is not the answer to soil conservation problems, but our place in the scheme of things is to provide the technology for good erosion control systems that will allow the farmer to use his land to its potential and yet conserve it for continued production. Thank you.

Senator CLARK. Thank you very much, Mr. Laffen. I think it's an excellent statement, and I thought, particularly, your emphasis on just practices, your statement that meadows are the best soil conservation possible. I think that's something we sometimes forget, that just wise use of the land, in terms of the productive capacity, in terms of what we do with it, in addition to the major kinds of permanent features.

We appreciate very much having your testimony. Thank you.

Mr. LAFLEN. Thank you.

Senator CLARK. Our last witness is Mr. Dale Riechlinger from Hinton, a farmer. Dale, do you want to come on up.

STATEMENT OF DALE RIECHLINGER, HINTON, IOWA

Mr. RIECHLINGER. Senator Clark, I didn't expect to be here this afternoon, but I'm here and thankful to be able to testify.

Senator CLARK. Dale, we're happy to have you.

Mr. RIECHLINGER. In regard to conservation and the practices, we have a lot of problems that have arisen in the last 3 or 4 years. I think, basically, a lot of the problems came from livestock prices and the needs of the small family, and the farmer wasn't able to take care of the livestock on his farms because of the lack of income.

Then, consequently, the children leave the farm, move into town, and labor is reduced. Large tractors become a practical thing, and then we start plowing up all the pastures and other land that's really unfeasible to farm, and we lose sight of what values that terraces, contouring, minimum tillage and all these things do for the soil. When you lose the labor force after losing the livestock price, you lose the labor force out there, consequently, it leads to these big tractors to farm their land in a different way. The large grain farmer has almost no use at all for a terrace. He thinks that they are the most useless thing that could be had.

I also believe that there is a lot of land in Iowa, South Dakota, Nebraska, and all over, that's strictly unfeasible to farm. It's the type of land that is just grazing land, and it should be left that way. It should be sowed down with good soil management and left that way, but with the livestock prices being what they are, I don't know what we can do about this. But, I'm sure there must be something.

Senator CLARK. I think it's a good point to make. It's one that hasn't been made today.

Mr. RIECHLINGER. And I believe in minimum tillage. I think that where the land is practical to farm, to use the minimum tillage methods of putting corn in. There are several on the market that are very good. They do control the runoff. Consequently, we haven't had too much moisture to worry about too much this year, but it is a water-saving thing.

I believe also that—and we talked about this one other time—that shelterbelts built or installed in the State of Iowa, South Dakota, Nebraska, North Dakota, and all these States, that they have a real

benefit. And I'm sure that everybody here will agree with me today that if you put a shelterbelt or a tree line through a farm, that behind this grove of trees or this line of trees, after a hailstorm, this guy doesn't lose all his crop. He saves some of it due to the wind. His corn will grow faster behind these groves, in most all cases.

And it breaks the hot wind in the summertime, and we're troubled with this here in western Iowa. And in the wintertime, we had a terrible disaster amongst the farmers in northwest Iowa a couple years ago with all the snowstorms. It piled snowdrifts up 30 feet high, over buildings, smothered livestock, and we asked people in Washington to help us get disaster loans for these livestock losses.

I'm sure that we have people in Washington that would like to know what we could do in these instances. I particularly had a chance to talk with a lady Congressman from New Jersey last spring in Washington, D.C., and she was wondering if there wasn't something that could be done.

Senator CLARK. Mrs. Meyner?

Mr. RIECHLINGER. Yes. And I told her I thought that, good, that these things would have a real benefit. There is some instances yet where you can go out in South Dakota and you'll see projects started during the 1932 administration of Franklin D. Roosevelt, that will show the objective that was reached there. I think it should be studied, and I—livestock prices, poor prices we've seen to meet the needs of the small farmer, larger machinery, and hurryup farming, and then, of course, do away with the terraces, do away with the shelterbelts, do away with the building sites and clean the land off so we can do this. This is what I think hurts more than anything else.

We can spend a lot of money to initiate new programs, which I think a lot of them are good, but most of the time we end up changing administrations or the amount of money allocated for the job, and it never gets beyond the planning stage, or if it does get beyond the planning stage, then, if some of these practices start, then, the farm changes ownership or something and the next fellow comes along and he tears out all the terraces and goes back to the original. I think these things need to be studied.

Senator CLARK. Well, I think you made a good statement, one we haven't talked about today at all.

What you find always in agriculture is that if you get an adverse impact in one area, it affects others, and I think livestock prices have clearly affected the decision of farmers to go in the directions that they have, and it's made it much more difficult for rotations, for meadows, for a lot of different reasons. I think it's a good point to make.

Mr. RIECHLINGER. Thank you very much, Senator Clark.

Senator CLARK. Thank you, Dale.

I want particularly to thank people here who made arrangements for these hearings. Wayne Lund, the Woodbury County ASCS office manager, in particular, and, of course, Homer Foster, whom I realize now, instead of Foster, I indicated Homer Ferguson earlier. Homer Foster, obviously, and particularly Homer and his wife, Elsie, and others, their son, who helped us to set these hearings up and all their cooperation.

I know that we had to cancel or at least temporarily delay these hearings, because we had some very important votes on the weekend that we hoped to come out here, and, of course, our first responsibility is to be in Washington voting, and so we had to set them aside until today.

I want also to thank Clayton Hodgeson with Berkley Bedell's staff, and Marvin Parker, who helped to set up the public address system and keep it operating and so forth, and Jim Richardson, certainly, the district director of ASCS.

I think the testimony we've had today, both here and in Council Bluffs, or down in that area, has been very helpful. You know, sometimes you may wonder what good it does to have hearings of this kind, have people come in and talk, and talk about what they think we ought to do differently. But, frankly, they have been quite helpful to us.

I remember that we came out here and held hearings in western Iowa with regard to the closing of American Beef Packers, because we found ourselves in a very difficult position. There was something like \$20 million in bad checks that were out that weren't covered by bonds and they weren't covered by liens, they had been paid through banks on the west coast and so forth, and we held hearings out here, and as a result of that—and one set of hearings that we held in Washington—and we went back and wrote legislation, and we now have passed in both Houses of Congress a packer bonding bill in which we have established three things: First of all, prompt payment. The farmers could be paid on the spot for the livestock that they delivered, and in no case later than the end of the next day, and then only if the farmer chose to take it that much later.

Secondly, we provided bonding for packers, something we hadn't had before.

Thirdly, and in some ways, most importantly, we provided in the law that the lien on the meat as it stays in the packinghouse would rest with the farmer as the first lien on that meat.

We passed that in the Senate and passed it in a little different version in the House, but they are substantially the same bills, and we're confident that we're going to have a bill on the President's desk before the end of this month—I think much before that. I hope much before that.

We came out here and held hearings, in fact, on grain inspection and some of the problems that we're having with misgrading and short weighing. We held hearings across the State. We went back and wrote legislation on that, and it has now passed both Houses, both the Senate and the House, and although we have some rather substantial differences between the House and Senate versions, again, it appears finally, now, that we're getting closer, and I'm confident that, again, on that issue, that we're going to have a bill on the President's desk by the end of this month or very soon thereafter, I think we're about to come to substantial agreements, based on our discussions of only a day or two ago with some Members of the House of Representatives.

So, I think that these hearings can be important, and nothing is more important, I think, in terms of the long-term future of this coun-

try, nothing is more important in terms not only of farmers, but of consumers and of people all across this country and across the world, than preserving our soil; for the reasons we've heard today. Reasons of water pollution. Reasons of productive ability, the ability to help feed the world.

You know, that one-half—normally, one-half of all the grain that's put on the international market comes from this country. Last year, two-thirds of all the grain that was put on the international market came from this country. This State produced most of the corn, more than any other State. This State produced an awful lot of the soybeans.

So, we've got a special responsibility here. We've got, as I say, one-fourth of the best farmland in the country right in this State. That's how important it is, and we've got to give it that kind of importance in our national priorities. When you think of the balance of payments, the value of our economy that this provides, you begin to see some of the high priority importance of preserving our soil.

I thank you for your statements and I thank you for your attendance.

[Whereupon, at 4:50 p.m. the subcommittee adjourned, subject to call of the Chair.]

ADDITIONAL STATEMENTS AND ARTICLES

(The following statement was referred to on p. 13.)

STATEMENT OF WILLIAM J. BRUNE, STATE CONSERVATIONIST, SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE, DES MOINES, IOWA

URGENT NEED FOR MORE CONSERVATION OF IOWA'S LAND

Senator Richard Clark—

It is indeed a pleasure for me to appear before your committee today and to have the opportunity of discussing with you the "Need for More Conservation of Iowa's Land".

The State of Iowa constitutes an important part of the highly productive Corn-belt region of the United States. This productive agriculture is made possible by large areas of high producing soils, a favorable climate, and able farm management. The ability of Iowa's soils to continue to produce excellent farm crops is dependent on a strong conservation program of permanent land treatment measures to maintain the soil resource base.

Before we broke our prairie soils and timber soils up for agricultural production, we had 12"-16" of topsoil over most of Iowa. And since we had less than 1,000,000 acres of cropland and pastureland 100 years ago, we can say we had most of that 12"-16" of topsoil then.

But we look at our soil now and we find that we have only 6"-8" of topsoil left in many cases. Our SCS statistical estimates for the Conservation Needs Inventory in 1967 showed that more than 10 million acres of Iowa soil were **moderately eroded**, and a million and a half acres were severely eroded. On those lands, more than half the topsoil has been washed away in 100 years!

We're still losing soil at an average rate of 13 tons an acre every year on unprotected sloping land. The state average for all soils is approximately 10 tons per acre per year. This varies from county to county. The flatter counties in north central Iowa will average 5 tons while the more complex sloping counties in western Iowa will run up to 25 tons. Thirteen tons an acre are equivalent to 230 bushels an acre—that means on most of our sloping land farmers are losing two bushels of soil for every bushel of corn they produce. Another way to look at it is that we're losing an inch of topsoil every 12 years. At that rate, we could lose most of the topsoil on these sloping lands in the state in the next 100 years. An estimated 200 million tons plus of sediment washes from Iowa cropland each year.

We estimate in SCS that only one-third of our cropland is adequately protected against soil erosion. By that, we mean erosion is held to a minimum, less than **five tons an acre each year**. So two thirds of our 26 million acres of cropland (about 20 million acres of rowcrop) need permanent conservation protection.

What could conservation protection mean? Let's take an example of a typical southern Iowa soil. Getting back to that 8" of topsoil we have left:

We have an 8" topsoil layer of Grundy silt loam on a 2 to 5 percent slope. If the farmer plants corn year after year, plows in the fall up and down hill and leaves no crop residue on the surface, he'll lose the entire 8" layer in 36 years.

If the field is contoured, but still fall plowed, the topsoil will last twice as long, or 72 years.

The topsoil will last 104 years if the farmer builds terraces on the contour, and continues to fall plow without leaving crop residue on the surface.

If he plows on the contour in the spring, and leaves as little as 2,000 pounds of residue per acre on the ground, the soil will last 176 years.

Finally, if he practices no-till farming, with contour terraces and crop residue on the surface all year long, the eight inches of topsoil will last 2,224 years. Long enough, our soil scientists say, to make some new topsoil.

Think about that. Farming in the most careless way, this valuable topsoil will last only about one-third of a century. Using the best soil conservation system, the original soil lasts 22 centuries, with more produced to take its place.

These figures are based on average annual soil loss predictions. In any one year, of course, soil losses could be much worse. Two years ago, in May and June of 1974, we had the worst soil erosion in Iowa we'd had in 25 years. Soil losses of 40-50 tons an acre were not uncommon—that's one-fourth of an inch. And some losses were four times that—200 tons an acre. One inch of topsoil in one year—or about one-sixth of the topsoil that remained.

We had some serious water erosion in 1975, and some again this year. More noticeable early this year, however, was wind erosion. The beautiful fall we had made it easy for farmers to get into fields in the fall, and they plowed a great deal of land. We estimated 8.5 million acres of land (most of it Iowa's best crop-producing land) were susceptible to wind erosion this spring. One third of that land (2.7 million acres) had some blowing on it this spring. The dry conditions we had and gusty winds filled the air with soil on several occasions.

Let's get back to our statement that only one-third of Iowa's land is adequately protected against erosion. Conservation work has been going on for 40 years; yet two-thirds of the job lies ahead of us.

A look at our cropland increases helps explain part of the problem. In 1960, about 12.6 million acres of corn and about 2.6 million acres of soybeans were planted. We had 7.7 million acres of oats and hay. 1976 estimates, on the other hand, show 13.4 million acres of corn and 6.8 million acres of soybeans. Hay and oats combined would total about 4 million acres. So what we have is a 5 million acre increase in rowcrops in the last 16 years. The new rowcrop land was protected against erosion when hay or oats were being grown—but as row-crop, it's much more erosive and needs protection.

Comparing the rowcrop increase with the amount of progress made in conservation each year, we find that in the past 16 years we've really just been holding our own in protecting land. On the average, 300,000 acres of land are protected in Iowa each year with conservation practices. In 16 years, that's 4.8 million acres—about the same as our cropland increases.

THE JOB AHEAD

What kind of a job do we have ahead of us? A rundown of the amount of major conservation practices needed gives some insight into the tremendous job that lies ahead.

Only about 59,000 miles out of a needed 368,000 miles of terraces have been built. Six million more acres need terraces. The job is only one-tenth complete on one of our most important (and costly) practices.

In the last few years, we've had some progress in terrace construction. In fiscal year 1971, we helped build 1,000 miles. That went up to 1,129 miles in 1972, but down to 706 miles and 499 miles in 1973 and 1974 respectively. Those figures reflect the fact that there was no cost-sharing one calendar year for conservation practices. Both state and federal cost-sharing were in effect after that time, and we rose back to helping build 1,114 miles in fiscal year 1975. We expect a similar figure this year.

240,000 acres out of a needed 349,000 acres of waterways have been built. The job is about three-fifths complete.

37,500 out of a needed 92,000 ponds have been built. We're a little more than one-third complete with this aspect of conservation work.

248,000 miles of a needed 360,000 miles of drainage work is completed. The job is more than two-thirds done.

20,000 out of a needed 47,000 grade stabilization structures have been built to control gullies. This job is again less than half done.

Conservation (Minimum) tillage is being practiced on more than one-fourth of Iowa's cropland, but there is potential for reduced tillage on all of Iowa's cropland. About 50,000 Iowa farmers use some form of reduced tillage (on 6 million acres). The question is whether they leave enough crop residue on the soil surface to control erosion.

We've made some estimates of the cost of this work, and the figures are a little staggering. We've based these estimates on the 1967 Conservation Needs Inventory, and I'd add that we feel they are conservative.

Terraces, our major earth-moving practice, are needed on 6 million acres. At a cost of \$265 an acre, all the terraces needed in the state would cost more than \$1.6 billion. It's by far our most extensively needed earth practice.

Stripcropping is needed on 635,000 acres, and at \$5 an acre, would cost \$3.2 million.

We need about 27,000 more grade stabilization structures to control gully erosion. At \$3,500 each, they would cost \$94 million. 54,000 farm ponds for a similar purpose at \$1,500 each would cost \$81 million.

We still need 109,000 acres of grassed waterways. At \$475 an acre, the total would be about \$52 million.

We also feel we need 15 million acres of cropland contoured and tilled with conservation tillage methods. We do not assign a cost factor to these practices.

On pastureland, converting areas to pasture and planting steep areas to better grass would cost about \$70 million.

And, to control erosion on woodlands, we think 83,000 acres need improvement at a total cost of \$5 million.

When we total all these estimates, we find that we have a \$2 billion soil conservation job in Iowa. That's the cost of the practices alone, without including technical assistance.

Current cost-sharing programs coupled with the funds farmers invest in conservation might total \$15 million a year in Iowa. Even at \$20 million a year, it would take 100 years to complete the job. Is this fast enough?

Past experience says it's not. We're a leading state in agricultural products, and we've lost half our resource base on most of our sloping soils. Think of how important agriculture is to this country—it's our latest export industry at \$22 billion in export sales a year (20 percent of all our exports). Each farmer feeds himself and 48 other Americans and as a group, farmers spend more than any other business—\$75.5 billion last year.

Agriculture is a strong basis of our economy, and the soil is the basis of our agriculture. Unfortunately, some of our soil has been mined, much like our mineral resources. Fertilizers have replaced topsoil to keep yields high—but there's a limit. We learned long ago in this country that soil is not a renewable resource within our lifetime, and time and time again civilizations have learned they'd better take care of what they have. Any cost-sharing monies or other programs that help do this would certainly be a benefit to our state and our country.

I want to thank you for giving us the opportunity to present our thoughts on needs for more conservation in Iowa.

STATEMENT OF ROY FAGAN, PROGRAM SPECIALIST, IOWA STATE ASCS OFFICE,
DES MOINES, IOWA

The Iowa ACP cost-sharing program begins shortly after National announcement of the program in Washington, D.C. The State program development group consisting of representatives from Extension Service, Soil Conservation Service, Forest Service, and Soil Conservation Districts meet with the State ASC Committee in development of the State program. Other interested persons may also attend this meeting and offer recommendations. The State group formulates a State plan for program operation which provides guidelines and policies to county committees.

More responsibility was given to county committees and the county development group in 1976 to develop their county programs and cost-share rates to the extent that the State ACP is now a composite of all county programs. The State program development group beginning with the 1975 program year has allowed county development groups to select any 1970 and 1974 practices in the State program in those years. In addition, the county development group could request permission to use any 1970 or 1974 National practices not in the State program.

Assignment of technical responsibility for practice need and application to the land is made by the State development group to the SCS, Forest Service, and State Wildlife Biologist. Only practices requiring technical assistance are assigned. Other practices are the responsibility of the county committee.

The State allocation of program funds provides for a transfer of up to 5% for technical services with the balance prorated to county committees, primarily on the conservation need shown in the Conservation Needs Inventory publication of 1970.

Upon receipt of their county allocation of funds and development of their program, county committees announce the county ACP and begin accepting requests for cost-sharing. Priorities are assigned to practices as they relate to the overall conservation problems in the county. They are also established for individual re-

quests for cost-share assistance. Farm allowances, conditional, first come, first served or factored cost-share approvals are not authorized.

The 1976 State allocation received January 12, 1976, for cost-sharing was \$6,-\$11,000 with nearly all being distributed to county committees on January 15. A small reserve of \$167,450 retained at the State office was distributed to county committees March 13. Only a sum of \$340,550 needed to pay for technical services to be furnished remained at the State office.

No State-wide limitation was established for long term agreements which last from 3 to 10 years. Each county committee decided whether they would offer long term agreements and the amount of funds to be obligated from the current allocation for the life of the agreement. The number of agreements approved is not known at this time, but appears to be considerable less than in previous years.

A State allocation of \$8,215,815 was received on April 8, 1975, for the 1975 ACP. A State limitation within this fund for obligations for the life of long term agreements was \$1,200,000, later increased to \$1,800,000. Nearly all of this sum was obligated. Also contained in the State allocation was \$2,343,815 to cover obligations for 1975 and future years' practices of the 1974 long term agreements. Funds not required to cover these obligations were later transferred to annual practices. County committees were not given an allocation for long term agreements, but could request funds within a limitation as needed to approve agreements. The limitation was used to insure equitable distribution to county committees.

The allocation to county committees for annual practices was made on May 2, 1975. Preliminary reports for annual practice cost-share approvals for six leading practices are as follows :

	<i>Percent</i>
Terracing -----	34.9
Waterways -----	19.6
Tiling -----	14.3
Water storage reservoirs -----	10.3
Permanent vegetative cover -----	6.5
Erosion dams -----	5.6

FOR THE 1974 RECP

Iowa received \$3,207,000 on January 14, 1974, out of a National allocation of \$90,000,000. The Senate allocation included \$30,000 for the new Forestry Incentive Program. Long term agreements, 3 to 10 years, were first offered in 1974 with a limitation of \$463,000 in the current year and a total limitation for the life of the agreements of \$1,850,000. When either limitation was reached, approvals were terminated. Only practices scheduled for 1974 were paid from 1974 funds with the balance paid from 1975 funds.

On March 13 two allocations were furnished county committees, one for annual practices and one for long term agreements. Shifting of funds between counties become necessary to cover long term agreements and to keep within the overall limitation.

The allocation to county committees for annual practices was used for cost-share approvals for 6 leading practices as follows :

	<i>Percent</i>
Terracing -----	52.6
Waterways -----	15.4
Water storage reservoirs -----	14.3
Erosion dams -----	11.1
Diversion terraces -----	3.1
Permanent vegetative cover -----	2.2

The 1973 REAP implemented as the result of a court decision provided a State allocation of \$8,722,000 received on April 9, 1974, for annual practices. County committees were allocated \$7,972,000 of this fund on April 19. It was necessary to hold reserves of \$500,000 to cover 1972 obligations and \$250,000 for other contingencies. Unneeded reserves held at the State level were allocated to county committees prior to the end of the program year to be used for cost-share approvals.

The allocations to county committees were used for cost-sharing approvals for six leading annual practices as follows :

	<i>Percent</i>
Waterways -----	20.6
Tile -----	19.9
Terracing -----	18.4
Water storage reservoirs -----	12.1
Permanent vegetative cover -----	7.9
Erosion dams -----	7.7

A survey conducted October 31, 1974, to find the potential for use of all 1973 REAP funds found only \$29,000 uncommitted. Unapproved requests due to insufficient funds totaled \$5,900,000. County committees nearly always have more requests than they have funds to approve.

The use of funds for approvals for cost-sharing for the six leading practices in other years as follows:

	<i>Percent</i>
1970	
Tile -----	17.9
Waterways -----	16.1
Terraces -----	12.2
Permanent vegetative cover -----	10.9
Water storage reservoirs -----	7.0
Erosion dams -----	7.0

1965	
Tile -----	25.0
Lime -----	17.2
Permanent vegetative cover -----	10.4
Waterways -----	10.0
Terraces -----	8.8
Water storage reservoirs -----	7.4

1960	
Tile -----	28.6
Lime -----	19.4
Waterways -----	13.8
Erosion dams -----	6.7
Water storage reservoirs -----	5.4
Terracing -----	5.0

Some significant changes in practice approvals for cost-sharing is apparent when reviewing records from 1960 to the present:

1. Terracing increased from 5 percent in 1960 to a high of 52.6 percent in 1974 and is 34.9 percent in the 1975 program.

2. Waterways increased from 10 percent in 1965 to 20.6 percent in 1973 and remained close to that percentage in 1974 and 1975.

3. Tiling decreased from 28.6 percent in 1960 to 14.3 percent in 1975.

4. Lime decreased from 19.4 percent to a negligible amount in 1975.

The average cost-share payment per farm in 1950 was \$75. In 1975 the average cost-share payment per farm was \$876 showing that county committees are making approvals more in line with needs.

STATEMENT OF RON GAHRING, LAND IMPROVEMENT LAND CONTRACTOR, GAHRING
CONSTRUCTION, INC., WILLIAMSBURG, IOWA

Agriculture Secretary Earl Butz has referred to the ACP as the biggest giveaway program in the U.S. today. In part I would agree with him.

I don't, however, think this was the intent of Congress when the program was created, at least I hope not. I would rather think that the Administration has turned it into that in spite of Congress.

To see the need for ACP one need only come to rural America, look at the land and talk to the people. Look at field drainage tile laid four feet in the

ground less than ten years ago now lying exposed. Not in a gully, but in the middle of a broad, flat field. Four feet of soil washed away from cropping the ground year after year.

The average farmer is not to blame. He really cannot afford to do anything different. He cannot afford conservation from a financial standpoint. In most cases he needn't worry about depleting the soil in his lifetime and why it is only his obligation to save it for future generations. He has to contend with the high cost of land, machinery, and money. The Government is encouraging him to crop every acre and raise all he can, then controlling his efforts to market his products.

The only thing pushing him to conservation is his conscience. His conscience and a fear of some far away bureaucrat forcing him to conservation. Many of the conservation jobs we work on today are done by farmers who are afraid if they don't start such measures they will soon be forced to. At a rate they can't afford. I think their fears are justified. In fact, I have seen examples of it with Iowa's conservancy law.

In my opinion the ACP could offer an alternative to such forced conservation. The Government offering to help pay for measures which the farmer couldn't possibly receive his investment back from. At least not in his lifetime. Measures like the outlet terraces which would save the soil for future generations.

However, the policies of the various administrations have imposed more restrictions on the program. Restrictions which have for 40 years kept the program on the ground. In checking with the Iowa state ACP administrator, I found that there had never been a directive to consider that land first in the administration of the funds. Instead there have been a great many directives to simply spread the money around. In reality, play the numbers game. Do a little something for everybody. Make it a welfare program. Pay less than 50 percent whenever possible. Try to pick projects which aren't too expensive so more can share in the program. All this done under the guise of getting the most out of the tax dollars. In reality, it has meant piecemeal conservation. Not ever getting enough done to curb any major problem.

In Assistant Secretary of Agriculture Robert Long's remarks before the 30th annual meeting of the National Association of Conservation Districts, he credited them with and I quote: "Putting roughly 1/2 of all U.S. farm land under excellent conservation protection." Just under 10% is a much more accurate figure. What's more we wouldn't be that far if we hadn't picked on the easy targets. The small projects which stopped the gully on the family farm by putting a pond at the upper end. For projects such as this, \$2500.00 went a long way. And it did help stop the gully. But in Iowa County where we're losing an average of 2 bushels of topsoil for every bushel of corn we raise that's not much progress.

We need first of all to quit considering this program as a welfare program. Stop administration policies of not cost sharing with the same farmer 2 years in a row, not cost sharing with land owners who might afford to do the work without the funds, not cost sharing with land owners who do not rely solely on the land for their living and other such policies. Instead be concerned with putting conservation on the land and saving the soil. Once the program is headed in this direction then it needs funds. Not the token amounts it has had in the past, but the funding of a responsible people concerned about saving the land.

To send \$87,000.00 to Iowa county to pay 50% of the 22 million dollars worth of terraces needed (and that's just one practice) is like trying to fill a bath tub with an eye dropper. It is almost equally ridiculous to limit funding to \$2500 when the average farm needs \$30,000 worth of work at today's prices. At the current \$2500 every other year, it would take 24 years if the needs don't grow in the mean time.

The program is needed not as Mr. Butz's pork barrel but as a responsible Government paying it's share of one of our countries most urgent needs. EPA funds should be used, tax advantages should be considered, more funding of ACP with new directives for its use, and more technical research to keep up with the changing demands of agriculture all to stop our soil loss.

Your efforts in the past are commendable, but your job in the future is staggering. I would be the first to admit I don't have all the answers, but my family has had three generation in this field to see the needs.

I thank you for this opportunity. The written copies of my testimony I will send to each of you along with some documentation of my remarks. I apologize for not having them ready, but some of the directives I have been trying to get I received only Saturday afternoon. Thank you.

STATEMENT OF JOHN R. SCHILD, BELLE PLAINE, IOWA

I am John "Dick" Schild, Chairman of the Benton County Soil District. I also am a member of the Iowa-Cedar River Conservation District.

The Benton County District Commissioners are charged with the duty of providing the state and Federal cost share funds on the farms of our county. Agriculture is charged with all out production. At the recent food conference at Ames, the world looked to the United States for extra food supplies. Senator Clark stated we have lost nearly one-half of our topsoil. This happened in 100 years. Do you think with today's farming up and down the hill, continuous corn and beans, removing of fences, removal of trees, etc. that the other half of our topsoil will last 100 years? What about future generations. One generation does for the next, i.e. roads, schools, churches etc. We must stop erosion of the soil if we are to survive.

The controls needed to stop erosion are more than one generation on the farm can afford. State cost share funds have been forth coming. Federal funding has to be begged from the present administration and President Ford and Mr. Butz would eliminate them entirely, impounding them twice after Congress voted the funds, saying the farmer should do this controlling on his own. We are always out of funds, the interest is there, farmers are willing to contribute what they can afford, but we need more cost sharing money.

Sewer, water, recreation, etc. are asking for more funds, lets have more for agricultural use in controlling soil and water erosion. Much of the money spent on soil and water conservation measures result in extra recreation areas and more water being retained in the subsoils and less flooding down stream.

The Iowa-Cedar River Conservation deals with pointing out the point and non-point sources of pollution. Soils are a big contributor to pollution, but we also have pollution from sewer systems, factories, feed yards, mining, etc. The Department of Environmental Quality wants all points of pollution mapped by January 1, 1978. The Iowa-Cedar district is the first organized in Iowa. The hand-writing on the wall indicates in the near future we will stop pollution.

My main concern is that all branches of the Government from President on down, realize that erosion, soil and water conservation, and pollution is everyone's problem, so it will have to be Federally funded in part.

Mrs. Schild and I are trying to do our part. We want our grandchildren to enjoy the resources of our nation.

We all need cooperation from the federal agencies in funding with a minimum of paper work. Due to the work load forth coming, contractors will have to have lands that are not in crop to put the controls on the land.

You have to protect people from themselves, so we need some kind of land use policy hopefully drawn up and controlled by the local people. One dollar earned on the farm is magnified to 5 as it passes through the small towns economic channels. This original dollar can not be earned on farms devoid of topsoil by erosion.

In fact erosion and the problem it creates: bridge erosion, city flooding, silting of recreational areas, etc., cost the tax payer money. Let's spend the money to put soil and water conservation practices on the land. Stop the drop of water where it falls.

STATEMENT OF DONALD BINNEBOESE, HINTON, IOWA

Gentlemen, the need for greater soil conservation should be clear to anyone who has traveled to rolling, sloping areas of Iowa after a good rainfall.

Unless we believe there's no end to our food production top soil—conservation should be supported by everyone dependent on that top soil for his daily bread.

I would say that if we as Iowans fail to take measures to protect the States most valuable resource (our food producing top soil) it could be tantamount to economic suicide for our state, cause great difficulty for our nation in balance of payments, and starvation for those in the rest of the world that rely on our food to sustain life.

Most everyone knows what caused our erosion and Agriculture pollution problems, they go hand in hand. Exit the small farmer with his rotation of fields and crops and full utilization of crop residues and manure from his small herds, enter big farmer, big machinery, concentration of thousands of livestock in small areas. Commercial fertilizer and chemicals of all kinds are dumped on

our soil by the tons to replace the manure and benefits of rotation by the small farmer.

To fully utilize the larger and even larger and more powerful machinery being produced, further consolidation of our farms was necessary. All that stood in the path of the big machines were the old buildings of the bankrupt small farmer, some fences and small pastures, a few trees, and a fishing dam and some terraces.

When the bulldozers were finished none of these remained and the 8-16 row planters could start on one side of a section, drive straight through to the other side, and back and forth till finished.

When the rains came there was nothing at all left to stop water, soil, fertilizer, and chemicals from filling our lakes and rivers and proceeding down to increase the size of the Mississippi delta.

To cure these problems (that were caused decades ago by a most unwise administration and Congress) will take strong medicine. It will take a law that says something like, all agricultural land above a certain percentage of slope shall be terraced tight with no runoff, except the once in 20 year rains of 5 to 50 inches of rain in 24 hours. All rain should be kept on the land where it falls and not allowed to run down stream to fill dams and build deltas.

Our larger farmers would surely oppose this strongly, and I'm personally not in love with terraces myself, but—if there's another way to conserve the nation's top soil and thereby insure future generations the opportunity to produce their own food—I don't know what it is.

De-consolidation of our larger farms and feed lots would go a long way in solving the rain problem of soil erosion and Agriculture pollution.

This testimony isn't to be taken as an indictment of the family farmer who by economic necessity increases his holdings of land etc., as he had no choice but to get big or get out.

If it should ever happen that by Government order inconvenient structures such as terraces, are forced upon farmers, then those farmers inconvenienced by them should be paid an annual fee for doing so by the American people as a whole.

It is also an absolute must to greatly increase exemptions in the Federal Estate tax laws. Failure to do so would spell the end of privately owned land and businesses.

STATEMENT OF DR. MERWIN D. DOUGAL, DIRECTOR, IOWA STATE WATER RESOURCES RESEARCH INSTITUTE, AND DR. T. AL AUSTIN, ASSOCIATE PROFESSOR OF CIVIL ENGINEERING, IOWA STATE UNIVERSITY, AMES, IOWA

INTRODUCTION—STATEMENT OF INTEREST AND SUPPORT

Senator Clark, other members of the U.S. Senate Committee on Agriculture and Forestry, staff members and others attending the Soil and Water Conservation Field Hearings. I am very pleased to have this opportunity to attend and contribute to the field hearings regarding soil and water conservation. The Iowa State Water Resources Research Institute is cooperating with other research groups at Iowa State University and the University of Iowa, including the Agricultural and Home Economics Experiment Stations, the Engineering Research Institute and the Science and Humanities Research Institute at Iowa State University, and other research entities at the University of Iowa at Iowa City and in further cooperation with the other colleges and universities in the State of Iowa to help solve the soil and water conservation needs of the State of Iowa. We have been very active in conducting research in various aspects of water, including the agricultural needs, rural and regional water supply and the agricultural impact on our water quality. I am presenting at this meeting for your use three books which have been published by the Institute regarding water problems in the State of Iowa. These are as follows:

1. "Agricultural Practices in Water Quality", edited by Ted L. Willrich and George E. Smith.
2. "Water Pollution Control and Abatement", edited by Ted L. Willrich and N. William Hines.
3. "Flood Plain Management: Iowa's Experience", edited by Merwin D. Dougal.

Water quantity requirements are equally as important in agriculture as to the urban dweller. Agricultural use of water in Iowa includes that needed for

rural domestic (in-the-home) uses as well as livestock production and supplemental irrigation. Additional studies have been supported by the Institute in regard to rural water supplies as well as other agricultural crop water requirements. This activity shows that the Institute fully supports soil and water conservation programs, is making appropriate technical, social, and institutional studies regarding agriculture and its soil and water requirements, and is directed to the solution of some of these real-life problems. The Institute is also involved in the State Water Plan effort which is now being conducted by the state resource agencies through the leadership of the Iowa Natural Resources Council. Soil and water conservation is a key part of the State Water Plan program. We certainly want to support additional attention to the topic of soil and water conservation, and would like to see increased federal, state and local participation in improved soil and water conservation programs. We will be most happy to work with your committee, and endeavor to develop new and innovative ideas for coping with the many soil and water conservation problems which are facing our State and our Nation.

THE MOVE TO FULL AGRICULTURAL PRODUCTION

The changes which have been experienced in the report trade area has certainly brought the agricultural community into an era of full crop production here in Iowa. We must admire the ability of the Iowa farmer to produce at a high level, making maximum and efficient use of technology and using a minimum of labor inputs. However, the increase in crop production has not been accomplished without loss in some of our soil and water conservation practices. We had a substantial amount of some of the hillier lands in Iowa under grass cover during the period when crop surpluses were evident, and crop acreage retirement programs were in force. In terms of erosion and sediment control, we probably had achieved as much as realistically could be expected. Many of these steep hillsides have been brought back into intensive agricultural production the past two or three years in response to the increased demand for agricultural goods.

The major problem facing us now is how to maintain a high level agricultural production, and maintain an acceptable level of erosion and sediment control on agricultural lands, and at the same time reduce the urban impact on our soil resource to a minimum level. We also have experienced some unique hydrologic events during the last three years, the same period in which agricultural production has increased tremendously. We have experienced three very wet spring seasons, with accompanying heavy amounts of rainfall frequently coming at high intensity, at a time when the agricultural soils were most vulnerable and most susceptible to severe erosion. Therefore, we have seen heavy soil losses and much erosion. Corollary gully and bank erosion have also been severe. In the last six months of each of the two preceding years, we have experienced below normal precipitation, and have seen our agricultural crops subject to drought stress. In addition, we have seen our water supplies depleted, and have moved into periods of deficient stream flow.

In the fall of 1975 and in the early spring of 1976, we became very concerned that the municipal water supply reservoirs in southern Iowa would be depleted before the end of this year. It was only the excess rainfall and runoff experienced in April and May of 1976 which has stabilized these reservoirs and have temporarily alleviated this problem. However, we suspect that the remainder of the year may again be a drought period, and that we may be in the midst of the drought cycle that has been discussed quite frequently, and which is being experienced in Minnesota, the Dakotas and in some areas in states east of Iowa. Therefore, we feel that we have been fortunate in Iowa to date to have had a sufficient supply of moisture to begin this crop season.

It would appear that we must restudy the soil and water conservation program within several new frameworks. These would include the role of soil and water conservation programs, both existing and potential, within the framework of the high level of crop production to meet export requirements, and also within the environmental context outlined in the National Environmental Policy Act of 1969 (NEPA). These two aspects should be reflected in developing strengthened and expanded programs for soil and water conservation in the nation. Ideas concerning these two modes will be discussed in the remainder of this presentation.

OVERALL PLANNING ROLE IN SOIL AND WATER CONSERVATION

Much of the soil and water conservation program is carried out through two agencies of the U.S. Department of Agriculture, the Soil Conservation Service

(SCS) and the Agricultural Stabilization and Conservation Service (ASCS). We believe that these programs should be meshed into a broader but total community planning program. This would need to take place within a strengthened local, state and federal cooperative program in which we could reach an equitable division of the share of cost of development among the three levels. There appears to be a move in the federal administration (Office of Management and Budget) toward a minimum of 50 percent sharing for capital investments by non-federal groups in these programs, and for 100 percent for operation and maintenance. This appears at this time to be completely arbitrary.

It would appear that this share percentage is a key item which should be studied. There will be certain development areas in which a large percentage of capital investment should come from the federal side of the picture, and there are some programs in which a greater percentage of local and state participation might be expected. In addition, development of an equitable share among the three levels will depend a great deal on the levels of taxation at these three levels. This would include not only federal revenue sharing, but also the ability, if the states and local governments are to provide additional funds, that certain federal programs thus being reduced would imply a lower federal level of taxation such that we would see a restructuring of the revenues from taxation rather than additional burden being placed on the citizen and/or the property owner and agricultural producer. Our research programs to date have shown, for instance, that the maximum potential that the agricultural producer should be required to pay for soil conservation practices is 25 percent, with 75 percent being required to be available from the state and federal governments if the soil conservation practices are to be mandatorily required. No matter what type of program is being considered, there should be some participation by each of the three (local, state and federal) although the exact percentages would be worked out through further studies. We have seen from the federal agencies a preponderance of wanting nonstructural measures to be carried out fully by the state and local governments, with little or no participation by the federal government. This would seem to be a weak linkage in the entire support structure, and further modifications should be proposed.

MODIFYING, EXTENDING AND IMPROVING OF THE SMALL WATERSHED PROGRAM

The implementation of soil and water conservation programs reached its highest levels with the passage of the Watershed Protection and Flood Prevention Act of 1954. This established a small watershed program as a means primarily of preventing floods in watersheds of 250,000 acres or less. Although development under the act has branched out into other areas, such as providing recreational facilities, it is still viewed primarily as a flood prevention program. Unless projects (which must be approved by the congressional agricultural public works committees) propose essentially flood prevention control developments, they stand little chance of being approved.

However, the key problem with the small watershed program has been the inability to have sufficient federal construction funds to fully implement the facilities investment part of the program. We find, through the delays in installation of projects, that we have administration opposition to funding new projects. The Soil Conservation Service reported that, as of January 19, 1976, 397 small watershed projects were completed and another 1,136 projects were underway. Uncompleted projects have created a 800 million dollar, ten-year backlog. It appears that the SCS expects to turn down projects in the near term until a better balance is gained between planning and construction. The Soil Conservation Commission would have the ability to carry out at least 20 to 40 new starts per year but the Office of Management and Budget has not requested any funds for new planning starts in fiscal year 1977. Therefore, a tremendous backlog of watershed projects has developed. It certainly appears that increased attention to this problem should be given by Congress. If this requires a restudy of the sharing ability of local, state and federal governments, it should be accomplished. Attention to the program is certainly needed if we are going to carry out an expanded multipurpose role of the soil and water conservation programs, to solve rural development problems.

We are aware that the SCS has been criticized by environmental groups for relying on dam construction and especially on stream channelization type approaches for flood prevention in the watersheds. We have seen environmental groups urge greater use of nonstructural measures to prevent flood damage. However, this seldom prevents flood damages to the full benefit of agricultural

production. It would appear that restudy of some of the technical methods of accomplishing flood damage reduction need to be made. Perhaps valley greenbelts and forest production are better uses. In addition, strengthening other aspects of the act so that other water uses have the potential for equal participation seems essential.

It would appear, as we have known in southern and western Iowa, that the water supply capabilities which can be achieved through the watershed program need to be expanded. Our rural water supply studies have shown that surface water storage is an essential requirement to meet some of the future needs for community and rural water supply in western, southern and southeast Iowa. In addition, these areas have a shortage of recreational water areas. Therefore, water supply, recreation, and fish and wildlife propagation are key elements which need to be strengthened in the soil and water conservation program. However, most watershed structures in this one cannot, because of the current high construction cost, cannot be economically justified on flood control benefits alone. There is no current federal program which will allow a federal, state, local cost sharing on water supply development. The limited taxing ability of many small communities and regional rural water associations prevent them from developing surface water supplies with multiple use capability. Currently there is no federal program to assist in developing projects whose primary purpose is water supply. New and innovative programs of federal, state and local cost sharing for water supply developments need to be implemented.

Another real need is in the area of the potential for developing additional forest lands, and perhaps other open space needs. First, in analyzing the flood plain damages and the improvements which can take place in flood plains protected by structural measures, we need some new and innovative ideas concerning the future land uses in these areas. We need to downgrade the channelization concept, and implement in lieu thereof, a green belt type of program which could use existing meandering streams and a timber belt along with it. Increasing the volumes of flood storage would enable these structural projects to further reduce the flooding utilizing the existing channel capacities and minimizing the amount of crop production in these flood plain soils. Research studies have indicated to date that seldom does the degree of improvement materialize below these projects as was planned in the watershed planning phase. Therefore, and bowing to reality, the planning group should begin to accept these ideas and further extend them.

Second, we feel that there is a great need for reforestation and renewed afforestation in the State of Iowa. However, this will be a long range program, because a growth of production timber will require more than a one generation investment. Therefore, in flood plain areas and in some of the more steeply sloping lands, it would appear that the forest potential should be studied as a new item and more attention be given to it.

It would appear that if we could give as much direct attention to the watershed development program, including the soil and water conservation program (on the farm practices and watershed development) within a community development sense, as we have given to water quality through Environmental Protection Agency, then we would have accomplished a great deal. In other words, if we can achieve through soil and water conservation programs, as much in-depth policy and implementation requirements as we find in PL 92-500, the Water Quality Amendments of 1972, then we will have directed renewed attention to the soil and water problems.

CONCLUSION

In conclusion, it appears that if we can modify and extend some of the previous policy acts implemented by Congress, and further work out some of the cost sharing potential and receive increased appropriations for these programs in a Federal sense, then improved soil and water conservation practices could be implemented. A new look at the overall planning role in soil and water conservation, in a parallel context to the environmental water quality improvements contemplated in the Water Quality Amendments of 1972, through PL 92-500, would do much in a corollary measure to improve the agricultural role and the environment. Equal attention by Congress to some of the funding requirements would be required to have a successful program.

I appreciate the opportunities to present this preliminary report, and brief comments as to some new ideas which can be considered. These need to be much enlarged upon, and we would be glad to continue to work with your committee in

expanding these ideas and providing additional material. I appreciate this opportunity to share new views with the committee and wish to thank you again for this opportunity to participate.

STATEMENT OF JOHN M. LAFLEN, AGRICULTURAL ENGINEER, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE, AMES, IOWA

In 1843, Edmund Ruffin observed that clean cultivated row crops were a direct cause of soil erosion by water. H. H. Bennett, in 1947, noted that soil and water are necessary to support human life, and that topsoil is the most vital part of the soil. Bennett, the father of soil conservation, estimated that erosion had forced the abandonment of 50 million acres for cultivation, and another 50 million were nearly as bad. He noted that half the topsoil had been eroded from another 100 million acres and an additional 100 million acres were beginning to suffer from erosion. In 1965, the Agricultural Research Service estimated that 35 million acres originally suited for cultivation had been abandoned because of excessive erosion. The Soil Conservation Service, in 1967, indicated that about 50% of Iowa cropland still needed more treatment to control soil loss caused by wind and water. Nearly every spring erosion scars, in an obvious way, much Iowa cropland. Obviously, our soil erosion problem is still with us, seriously threatening the productive capacity of our soil resource.

Soil erosion can be controlled on nearly any cropland through the application of existing technology. Rotations, contouring, terracing, conservation tillage, and meadow can be used singly or in combination to reduce soil loss to levels whereby the soil resource can be maintained forever. Additionally, the protection of the land will certainly improve water quality, and reduce offsite damages due to deposition of eroded sediments.

The Agricultural Research Service, cooperatively with State Agricultural Experiment Stations, has developed an equation, the Universal Soil-Loss Equation, for predicting soil loss from the land. It is used worldwide by nearly anyone trying to predict soil loss under any circumstances. The same equation is used to predict the protection needed for a shopping center under construction in Maryland and the rotations needed to keep soil loss within tolerable limits for a specific field in Pottawattamie County, Iowa. The effect of terracing, contouring, and cropping sequences on soil loss from agricultural lands has been incorporated into the factor values used in the equation. Research is underway to improve the equation's usefulness and to adapt it to new situations that man creates.

Changes in farming have forced the abandonment of many rotations and terraces to control erosion. Terrace systems that are not parallel will hardly be used in areas where row cropping is extensive. The change in livestock enterprises has reduced the need for meadow and small grain. Iowa cropland is now almost exclusively used for corn and soybean production. New or improved conservation practices must function in this kind of agriculture.

New terrace systems are parallel and usually drain via underground outlets. They are very expensive, but reduce soil loss from cropland greatly. We have found that about 95 percent of the soil eroded between terraces is kept on the land, improving the quality of water discharged and keeping the eroded soil near its point of origin. However, terraces don't appear to be a viable means of controlling erosion over a large area in Iowa. They will be important in specific cases, but the size of the construction industry required, the technical staff required, and the high cost of construction and maintenance needed to protect an appreciable percentage of Iowa cropland boggles the mind.

Conservation tillage is any tillage system that reduces loss of soil or water relative to conventional tillage. The principle is that crop residue on the soil surface reduces soil erosion by slowing runoff water and reducing the area over which raindrops impact directly on the soil. The more residue left on the surface, the lower the soil loss. Our research results indicate that corn residue over 20% of the soil surface may reduce soil loss 50 percent.

Conservation tillage appears to be a panacea for our erosion problems, at least on the surface. Conservation tillage could be used by all farmers within a relatively short period of time, say a decade or so. No gigantic increases in farm machinery production or in the construction industry would be required since the use of conservation tillage would require only a change of planting and cultivating equipment, something most farmers would do in a short period.

The USDA Office of Planning and Evaluation in 1975 noted that conservation tillage could be used on 80% of US cropland; 50% could be farmed without tillage. The North Central Region, according to an analysis by Iowa State University's Center for Agricultural and Rural Development, would have 6 times (or more) the conservation tillage of any other region of the country. The use of conservation tillage could boost harvested land by 20 million acres and agricultural production by 5 percent.

Our research results in Iowa indicate a yield reduction in the use of conservation tillage. Results in other states indicate that there are climate and soil interactions that could limit the use of conservation tillage. Crop residue on the soil surface may help diseases and insects survive Iowa winters, leading to increased infestations. Weeds are a problem with any crop production system; they are especially so with conservation tillage. While conservation tillage can eliminate soil erosion as a serious threat to a lot of Iowa cropland, it can only achieve widespread acceptance when we're able to provide the technology for Iowa farmers to use it successfully.

At Iowa State University, federal and state scientists have joined together to form a conservation tillage research group. Our goal is to provide Iowa farmers with the needed technology for successful use of conservation tillage. The research group includes engineers, agronomists, pathologists, entomologists, a geneticist, an economist, and a statistician. We've prepared an inventory of research needs and are presently preparing specific research proposals. We are receiving good support from our state and federal administrators.

Conservation tillage would likely require more and/or new and different pesticides. How does this affect the soil and its biota? How would this affect the quality of runoff waters?

Conservation tillage may increase diseases and insects. How do we control these? The cool conditions in the spring under crop residue reduce germination and early growth. Can varieties be developed that are resistant to diseases and that grow well under the conditions encountered with conservation tillage?

Weed control under the conditions of conservation tillage is different than under clean tillage. New control techniques must be developed; new chemicals may be required. Weed control is usually cited as the major problem with conservation tillage.

Management information for selection and use of conservation tillage systems must be developed. What systems should be used and where? What size of machinery is optimum for specific farming enterprises?

Machinery that can plant under conservation tillage conditions must be developed. Little equipment is available today that can plant and cultivate reliably when considerable crop residue is on the surface.

Topographic limits of applicability of conservation tillage systems need to be determined. Apparently, the limits will vary with soil type.

The questions raised above indicate that conservation tillage is not a panacea for our erosion ills. It can be a major weapon in allowing us to produce food and keep our soil resource. While we are beginning considerable research in conservation tillage, research efforts must continue on terrace systems, rotations, interseeding and other soil conservation practices.

Research alone is not the answer to soil conservation problems, but our goal is to provide technology for good soil erosion control systems that allow the farmer to use his farm to its potential and yet to conserve it for continued production.

STATEMENT OF HON. ROBERT H. LOUNSBERRY, SECRETARY OF AGRICULTURE, IOWA
DEPARTMENT OF AGRICULTURE, DES MOINES, IOWA

I am Robert Lounsberry, Iowa Secretary of Agriculture. I am pleased to have the opportunity to express my views on the federal cost-share programs for soil conservation.

Our soil is our most valuable resource. The new wealth created annually from our agricultural production, which has contributed so significantly to the standard of living in Iowa and the U.S. has only one base—our soil. Iowa has 25% of the Grade A land in the United States.

Having been a farmer for twenty-five years, I have been appalled the last three years at the tremendous loss of topsoil that has occurred since we have been in an "all out production" posture with nearly 50% of our land being in the row

crops of corn and soybeans. The losses each spring have been tremendous and this soil can, of course, never be replaced in our lifetime or even our grandchildren's.

We are so used to deep topsoil and rich land that we have become oblivious to the loss we suffer from the small gullies and ridges in the field after a rain and the dust on the windowsills and dirt in the ditches. While we may not suffer for its loss, there is no doubt that our grandchildren, and the world which they are going to be asked to feed, will feel its loss very significantly.

Environmental problems also occur when our soils wash and blow. We are increasingly aware of the necessity for controlling the runoff of pesticides and soil nutrients into our streams. We find that if we are able to control the runoff of sediment—our topsoil—then we can almost totally prevent the loss of these nutrients and the runoff of our pesticides into the streams, keeping them where they were intended and stopping pollution.

While the problem is great, I'm always impressed with the fact that we have available to us today the technical knowhow to handle this problem. We know that we can, in most instances, reduce erosion to below the soil loss limits through use of permanent soil conservation practices, i.e., terraces, critical areas seeding waterways, erosion control structures, tree planting, and diversions.

What is lacking is not technical knowhow, but financial resources. The job cannot be done by landowners alone and some financial assistance must be offered to offset the tremendous expenses. This is not a "handout" to the farmer, but society committing itself to a productive future.

As Secretary of Agriculture I am an exofficio member of the State Soil Conservation Committee. I believe, and so does the State of Iowa, that soil conservation is a significant enough program to involve the use of tax monies as a cost-share incentive for the establishment of long term, permanent soil conservation measures. For the 1976-77 fiscal year the amount for cost-sharing from the State of Iowa will be 4 million dollars. This is the 4th year of this program, which has had wide bipartisan support. There has been wide interest in these programs by Iowa farmers, but the amount of money is just too small to handle the huge job we have to do. Costs have increased by as much as 100% on many permanent practices in the last 4 years. Also complicating the issue are the deep cutbacks in technical people (over 100 in the last 9 years) working for the Soil Conservation Service in Iowa.

Of course, the various federal cost-share programs have also been available to Iowans. These have been subject to criticism by some elected officials including several of our presidents, who have called them the rural congressman's pork barrel. While portions of the program may fall into this category, some of the criticism is unfair and dangerous. Cost-sharing for permanent soil conservation practices is an absolute must. Costs to build these measures have exploded, so that the individual landowner often cannot afford to construct them. And yet society ultimately has more to gain by keeping the soil on the land than does the individual. Therefore a sharing of costs between the landowner and society is only right. The State of Iowa also believes this and has contributed, as it should, to this effort. Certainly the federal government should also be involved in these programs. I would hate to see the whole program scuttled because of the criticisms of parts of the program which have nothing to do with protection of our soils.

Much of the criticism has been leveled against programs which may be called "production oriented". If the federal government wishes to participate in cost-sharing activities for increased production from our lands I certainly do not object. Eventually the world is going to need all the production which we can bring forth from our lands. However to call these programs "soil conservation" programs is inaccurate and jeopardizes the entire soil conservation program.

TO SUMMARIZE

We must have soil conservation cost-sharing on both a State and Federal level to protect our great wealth—our soil. It should not include money for "production practices" if it is for soil conservation. Costs have escalated greatly and cost-share moneys must increase to match them. Adequate technical assistance must also be available.

Society has so much to gain and we all have so much to lose if these programs are not implemented. I would therefore again urge your consideration for the continuation and increase of these very vital areas of a program which is

critical in the long run to the abundant production of our land. Thank you for the opportunity to present these comments.

STATEMENT OF WALLACE SIMM, O'BRIEN COUNTY COMMITTEEMAN, PAULENA, IOWA

I am Wallace Simm, a member of the O'Brien County ASCS Committee, and I would like to tell you why we, the O'Brien County ASC Committee, feel there is a definite need for a cost-share program to help prevent the loss of topsoil at an excessive rate throughout this great country of ours.

First, we as the elected committee for O'Brien County, have always tried to be fair in the administration and use of any Government funds. One of our highest priorities has been the encouragement of tree planting. A person wouldn't have to drive very far in rural Iowa to see all of the effects of wind erosion that has occurred just in the past winter and spring and there is no doubt in our minds that we, as conservation minded citizens, should get everyone to plant trees, replace old groves and even set out shelterbelts to slow down the wind as it tends to sweep away our topsoil.

Another top priority in our county is terracing. I am sure most people know the importance of this practice. The most significant one being the holding back of moisture so it will soak into the soil rather than just run down the slopes and into the creeks and rivers.

We have another practice that is high on our list also and that is sod waterways. There is a great need for these in many parts of our country. Oh yes, we know some people say you can't spend money on waterways until the upland is treated, but we feel we have to start someplace and if we encourage farmers to put in these waterways the operators on the uplands will see the benefits and install the practices needed to complete the conservation job. If the American farmers are going to attempt to help feed all the hungry people in the world, our farms are going to have to be upgraded and taken care of in the best way we know how.

We have tried to promote the seeding of marginal land and have always been very careful how the funds have been used for the purchase of minerals. Of course, if these are needed to establish the seeding, then we feel it is very essential to use them.

Now comes one of our most expensive ventures, the installation of anti-pollution practices. This seems to be on the mind of every person today and, as the farmers of America try to produce the huge quantities of meat our society is used to consuming each year; one can see how we have specialized in meat production. Now we ask ourselves, should the American farmer be expected to bear all the expense for building all the holding pits and lagoon systems to keep from polluting our water supplies and streams?

We, the O'Brien County ASC Committee, honestly believe conservation programs can be administered better at a county level than by someone at the Washington level. It is hard to believe someone clear out on the east coast would know the needs of our county better than we. We are every much in favor of local control and feel it should take an annual allocation of \$50,000.00 in our county to help take care of the minimum needs of conservation through the ACP program.

In conclusion, let the county committees make the decisions as to how much money it will take to encourage a farmer to install the conservation practices on his farm. After all we are continually encouraged to get the most conservation work for the least amount of money.

On behalf of the other members of my committee, I would like to thank you for listening to our beliefs. If there are any questions, we will be pleased to attempt to answer them.

STATEMENT OF CLIFFORD STILLE, CHAIRMAN, EAST POTTAWATTAMIE COUNTY SOIL CONSERVATION DISTRICT, OAKLAND, IOWA

In regard to the hearings of the Senate Committee on Agriculture and Forestry, I submit the attached information. This information is taken from the records of the East Pottawattamie Soil Conservation District.

As you can very well see, the amount of cost-share funds available has a direct influence on the amount of terraces applied to the land. No cost-share funds were available to the farmers in the first half of 1973. The State of Iowa cost-share program was implemented July 1, 1973, and we did get 20 miles of terraces built that fall. However, this was about one-third of what could have been done with normal funding.

Money was available in 1974, but farmers and contractors had had many plans disrupted in 1973, and they were cautious in 1974. Not until 1975 did we get back to normal. This year, with both state and federal funds available, it looks like a record-breaking year for applying conservation to the land. We already have 35 miles completed out of 45 miles laid out for construction. District co-operators are very interested in doing more. We have applications for nearly \$143,000 of cost-share money in the East Pottawattamie Soil Conservation District. These all came in after January 1, 1976. This figure is only half the total estimated cost. Neither does this figure include any ACP requests.

Please note the following table on terrace application in East Pottawattamie County.

TERRACE APPLICATION—EAST POTTAWATTAMIE COUNTY, IOWA

Year:	Miles completed	Federal funds	State funds
1971.....	45.3		0
1972.....	57.9	\$43,342	0
1973.....	20.5	11,749	\$6,942.75
1974.....	42.4	34,632	23,912.46
1975.....	59.5	33,136	41,282.59
1976.....	135.0		

¹ Completed to date.

Conservation needs for 1967 was as follows:

	Acres
Total land.....	285,051
Total cropland.....	253,677
Total pastureland.....	17,926
Terraces needed in 1967—6,274 miles.....	101,225

For 1976, we estimate the total cropland is now 265,603 acres. Hayland and pasture has been reduced.

Terraces needed are for 113,151 acres, or 7,028 miles, minus 2,125 miles on the land, or 4,903 miles needed yet today. At the rate applied when funds are available (omit 1973), it will take 96 years to apply this amount.

We could use more people effectively. Personnel restrictions limit the manpower we hire. We need the personnel ceiling for Soil Conservation Service raised by Congress as the office of Management and Budget will not raise the ceiling voluntarily.

How would we make more progress in conservation with more people? We have six months of heavy terrace layout, and we need another good man for it. We need an employee of professional status for planning and working with groups. These areas have been neglected. Also, RC&D and Watershed Programs will take more staff time in the future. We feel that WAE does not solve the staffing problem, as we cannot get and keep good employees with WAE conditions.

Another area we must look at is the administration of cost-sharing funds. What is the total cost to the taxpayer for the resource conservation received? What is the ratio of administrative costs to construction costs? In order to accomplish this job rapidly, we must have the lowest possible administrative costs.* There are other ways to distribute cost-share monies than currently used, such as a grant to the soil conservation districts or a tax set-off similar to investment credit.

Finally, what amount of funds should be available for resource conservation? Remember, we are exporting grain to keep a favorable balance of payments for the citizens of the United States. We cannot continue this if we lose our productivity through soil erosion.

*NOTE.—Iowa's cost share funds are one hundred percent available for construction, as the additional work of cost-share administration has been absorbed by the present staff. Federal cost-sharing administration takes about one dollar for every dollar used for construction of the actual work.

STATEMENT OF PAUL JACOBSON, R.F.D. 1, DOW CITY, IOWA

It is, indeed, gratifying to find someone, high in government, who is interested in the conservation of our soil, our most precious resource. The loss of this resource could cause civilization, as we know it, to decline. I have traveled throughout much of the world and in no place is there an area similar to that in Iowa and Illinois which, to an equal extent, has what is needed for high crop production—namely, adequate rainfall, calcareous soils of loam or silt loam texture, summer temperatures conducive to crop production, and slopes suitable for equipment operation. These two states—Iowa and Illinois—produce one-third of the total grain tonnage produced in the United States, each state about equal amounts. Approximately another third is produced in states adjoining Iowa and Illinois. Surely, this should give our government a major incentive for expending every effort to save the soil in this area which is so important to the final greatness of our country.

Your announcement, Senator Clark, indicates that you are alarmed by the increase in erosion due to intensive cropping presently being advocated by the United States Department of Agriculture. This is just cause for alarm.

A casual look at any of our sloping lands, subject to erosion, indicates that these lands are now predominantly in clean tilled crops. A rain of high intensity could result in erosion where an inch of topsoil is lost—roughly the equivalent of 150 tons per acre. Such rains occur each year at scattered locations throughout Iowa. Just three years ago such rains were general in Iowa.

Another factor that makes a new look at our present national erosion control program of vital concern at this time is the apparent lack of progress. Twelve years ago I retired from the Soil Conservation Service after thirty years of service. At that time, it was estimated that we had the job of Soil Conservation about one-third completed. Today, a look at the fields in erosive areas indicates that we have made little progress in conservation in the last twelve years. I doubt that anyone, looking at erosive lands, would estimate the job is more than a third done.

Part of this apparent lack of progress is due to the increased emphasis on feed grain production. Much of the early program was based on control of erosion through crop rotations. With the land mostly in row crop, rotations are no longer common. Also, many of the original terrace systems were poorly planned for today's efficient farming. Consequently, many of these terraces have been removed or allowed to deteriorate so they no longer provide control.

Today, one of the major methods being advocated to control erosion is minimum tillage. This practice has shown promise in reducing soil loss on lands with moderate slope. However, use of this control practice introduces problems which will grow with time. The major one is weed control which becomes more difficult each year the practice is used. Control of weeds on cultivated land where minimum tillage is used depends on herbicides and, over time, weeds build up resistance to herbicides. Another weakness of minimum tillage is lack of control where soy beans are used in the cropping program. Soil loss is high where the corn is grown the year following soybeans.

Speaking as a farmer, we have used minimum tillage on our farm for several years and have experienced all these difficulties. Each year we tend to go back to the use of the conventional plow on more and more acres. On our farm we can safely use the moldboard plow. Soil loss is not a problem since the mechanical system of a bench type terraces with tile outlets keep soil loss to downstream areas at almost zero. In the words of H. H. Bennett "Water is made to walk, not run."

In the early days of erosion control we, in the SCS, set up pilot watershed programs to demonstrate new principles of erosion control. I believe it is time for us to go back to this principle and to set up some new pilot watersheds to study new and alternative solutions for erosion control. During the past several years—I have been working toward this goal with you, with Representatives Berkley Bedell, Tom Harkin, Bob Bergland and others to get watersheds of about a thousand acres each, to study such a program for complete upland control.

In such a watershed program the terrace system should be planned using topographic maps. Topographic maps are of utmost importance. No reliable company would construct a \$30,000 building without an adequate plan. Yet, today terrace systems costing \$30,000 or more are being laid out in the field without

adequate preplanning. Terrace systems, planned in advance using topographic maps, would provide for more efficient use of machinery and, at the same time, would provide adequate erosion control. On areas having irregular topography the system could be designed so that terrace alignment would be improved by accumulation of sediment or by land grading.

Using the watershed approach has the advantage that participating farmers will encourage one another and so will get the program applied. The effectiveness of this approach in obtaining upland treatment has already been demonstrated—the Macedonia Watershed is a landmark. It is located near Macedonia, just southeast from Council Bluffs. It demonstrated how farmers working together encourage one another to install terrace systems. This watershed is completely protected by terraces from serious erosion. Terraces protect the land from erosion even with intensive cropping.

I mentioned solving problems because—with every new and different treatment there will be problems. On any program which adapts land surfaces to eventually provide erosion-free farming areas, some problems will occur along the way. Where terraces have been straightened to provide ease in farming, heavy accumulation of sediment may occur in the original waterway. On years when this occurs, some crop loss results and harvesting the crop is more difficult. Fortunately, this type of modification will generally be limited to a rather small area on any farm. On my farm it was limited to about 30 acres out of the 307-acre farm. On much of Iowa land, slopes will not dictate the need for any of this type of treatment. An example of gently sloping land on my farm is the east 25 acres; slopes here are six percent or less. On this area, erosion has been controlled with almost zero soil being moved—even with continuous row cropping. Farming has been done with straight rows across the predominant slope. In Iowa, erosion control by use of earth fills with tile outlets is possible in a large proportion of the state. It could be used in the following soil areas: Floyd-Clyde, Sac-Primghar, Sharpsburg, Mahaska-Taintor, Tama, and other similar soil areas of moderate slope.

In conclusion—I believe it is time for us to quit kidding ourselves about all our accomplishment in obtaining soil conservation on our productive Iowa lands. Let us be honest with ourselves and admit, as we did in the early program of the SCS, that new approaches are needed. I believe the watershed approach may be the answer to getting a more permanent erosion control program on the land. I will be happy to work with you and others in Congress to set up a conservation program for more effective erosion control from the money expended.

STATEMENT OF LOUIS P. CULVER, CHAIRMAN, HARRISON SOIL CONSERVATION
DISTRICT, LOGAN, IOWA

We shall attempt to highlight some of our soil conservation district programs and provide some of the data we use as a basis for determining the priority of the problems we devote our efforts towards. For this reason we shall use a topic outline of format rather than lengthy explanations of the subject.

LAND TREATMENT NEEDS IN THE UPLAND

Seventy-five percent of the District, generally interpreted from the Conservation Needs Inventory report. We have included a shortened version of this report.

This report shows 195,400 acres need treatment. If 40% is done this would still require some 3900 miles of terrace at a cost of \$14,459,600.00; 1976 prices. If the present rate of Federal cost share \$80,000.00 annually and State cost share \$45,000.00 annually are used it will take another 58 years to complete the needed treatment. This with a national objective of stopping almost all downstream siltation by 1985.

This does not include any of the 418 structures needed (at \$25,000.00 each) or pastureland basin terraces.

In considering cost sharing programs continuity is very important. Farmers need advance notice so they can have land available during construction season. Contractors need time to plan their work and to have necessary equipment available. One system that fits the needed continuity promotion and economic backing is the Long Term Agreement concept, where the landowner signs a contract with the Federal Government to complete all the conservation work needed on his farm.

WATERSHEDS

A. Mill Picayune—being constructed

1. Sixty-three thousand acres, 153 structures.
2. In Harrison, Shelby and Crawford County Soil Conservation Districts.

B. Mosquito of Harrison

1. Twenty-four thousand five hundred acres, 57 structures.
2. In Harrison and Shelby County Soil Conservation Districts with major portion in Harrison County.
3. Hampered by lack of funds for land treatment above structure sites.

C. Allen Steer Creek

1. Sixty-four thousand acres.
2. Preliminary plan completed by Soil Conservation Service. Awaiting acceptance by local people. Two large structure sites, which will form fine recreational and housing areas need outside financing and interest to instigate land acquisition. When this is resolved final plans can be developed and 30,000 acres of Missouri River bottomland will be protected.

D. Cobb Creek

1. Four thousand five hundred acres.
 2. Awaiting planning priority. Priorities limited because of manpower and funds available from Soil Conservation Service to do planning.
 3. Local interest very high. Upland treatment currently 70-80% completed.
- This is a very brief resume of some of our work and our problems in providing the manpower and financial help necessary to meet the erosion control standards we promote and have helped set.

If you desire information specific to any part of this letter or the material we have enclosed, we shall be happy to supply it.

MEMORANDUM

U.S. DEPARTMENT OF AGRICULTURE,
AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE,

July 12, 1976.

To: Senator DICK CLARK.

From: Harrison County.

Subject: Amount of ACP cost-share funds Harrison County could dispense if funds were available.

Following is a listing by years of amount of money received for RECP, ACP, FIP, LTA and ECM.

1973 REAP and 1974 RECP: Both years were dispensed in 1974.

1973 allocation was \$91,440 and 1974 was \$40,101.

Of this \$131,541 all was spent on permanent water-soil conserving practices except for one wildlife habitat practice (3 acres) and 2 tree planting projects covering a total of 3 acres. In addition \$14,128 was set aside for LTA's in 1974.

Harrison County could have used \$200,000 total in permanent soil and water conserving practices such as terraces.

In 1975 Harrison County received \$68,660 ACP cost-sharing funds which was used to build terraces on 96 farms. \$3,318 of ECM funds was also used to help 18 farmers repair terrace damage caused by heavy rain on May 6, 1975. In addition \$27,920 was set aside for LTA's in 1975.

We could have used 3 times as much money (\$205,980) for permanent practices.

In 1976 we received and spent \$74,574.50 ACP funds, \$8,291.00 ECM funds for repair of terraces, and \$1754.00 for FIP. For all practical purposes the \$82,674.00 was spent on terrace systems before July 1, 1976. In addition \$8,100 was set aside for LTA's in 1976.

We could easily use \$240,000 ACP funds for terraces in 1976 if they were available.

Yours truly,

LEROY BAKER, CED.

STATEMENT OF FRANKLIN KINKADE, CHAIRMAN OF THE BOARD, IOWA LAND
IMPROVEMENT CONTRACTORS ASSOCIATION, CRESTON, IOWA

IOWA'S NO. 1 RESOURCE IS IN ITS SOIL

The government is urging all out production but not all out water and soil conservation. With this increased production (which, by the way is for the consumer, not the farmer) farmers are intensively cropping rolling land which should be left for pasture or long rotation. Consequently, although we have farmed Iowa for only one hundred years, our top soil could be gone in one hundred years. Do you realize it takes four hundreds years to replace one inch of top soil? We are losing an average of two hundred thirty bushels of top soil on each acre of unprotected farm land.

Congress is trying to set a national budget ceiling. The administration is still recommending "zero" for agriculture conservation practices. I would like to call some things to your attention.

In 1936 Congress passed the Soil Conservation Act with the provision that Congress could authorize annually up to five million dollars for basic soil and water conservation practices. This year the national allocation, which has been decreasing drastically was reduced to eighty five million dollars by the administration. Congress however was successful in increasing the allocation to one hundred seventy five million.

The partnership arrangement in 1936 was to have the farmer put up 10 percent and the rest of the citizens put up through taxes 90 percent. Through the years this has been equalized so that the farmers now put up 50 percent of the money, besides carry out the practice.

Opponents, of course, think the farmers should do it all. I remind you that India and China are in the shape they are because they misused their soils for centuries, without putting any thing back. It is a national cause not just the individual farmers!

Secretary of Agriculture Earl Butz said, "Of the sixteen billion allocated to USDA in 1976, approximately two thirds went for food welfare programs, food stamps, school lunches, child welfare, nutrition, etc." These programs should be funded by Health, Education, and Welfare, but the people in charge do not really care for the unfavorable publicity. It is better to say USDA spent all the money for farm programs.

Estimates show that terraces are the major cost item, approximately two hundred sixty five dollars per acre. Although 57,000 miles of terracing built in Iowa are enough to stretch twice around the world, the total job is still only one tenth complete. I don't think people realize how big a job it is to protect Iowa soils.

More than one third of Iowa land is protected against soil erosion. Some is protected by grass and forest cover and some with conservation tillage, terraces, waterways, etc.

These practices were put on the land, voluntarily, by conservation minded land owners, a great deal at their own expense.

The future productivity of our land and the future quality of our water depend on a strong conservation program.

I hope you are convinced "Soil Conservation Is a Must" if we must eat and we must. We the government should encourage and cost share permanent types of conservation practices.

We would recommend that the Agriculture Conservation Program (ACP) be funded at its original authorized level, five hundred million dollars.

In 1936 five hundred million was 6 percent of the budget. Today it is only .14 percent. If Congress authorized the same percentage in 1977 the ACP would be authorized at twenty billion dollars. In 1974 only 3 percent of the nation's farmers were able to participate compared to 50 percent in 1946. Cost share requests today are running several times the available funds so far in 1976. We would also recommend that the authority of the farmer elected county committees be maintained.

Mr. Frick of the USDA went against directives of the Congress and restricted the county committees in selecting conservation practices for farmers to carry out. For that reason Congress passed legislation last year mandating that the county committees be able to select their own practices, rather than being forced to follow the dictates of Washington. Congress must pass similar legislation for the 1977 ACP. These changes would enhance the conservation of our greatest natural resources—our soil and water. Some four billion tons of soil are lost

each year to erosion. Experts note that we are draining these two resources faster than either India or China did. This would also supplement the four billion dollars the administration has requested to clean our waterways by preventing much of the sediment (our number one polluter) from ever getting into them. These measures would insure that we can expand our food production in future years to feed the world and to save our balance of payments. It would also contribute to Energy Conservation by preventing the wasting of fertilizer in the humid area.

I would like to point out that if funding were restored to the five million dollars yearly that Iowa has one fourth of the prime land in the United States and in effect should receive one-fourth or one hundred twenty five million instead of the less than seven million under present funding. The need is that great!

We need total farm plans to be developed for conservation practices on every farm and funds provided and a reasonable time to implement them. In many areas even though the farmer gets some cost sharing on terrace work, a more expensive measure of tiling would have to be done because of side hill seeps or to develop wet bottom ground and retire the hills to a reasonable rotation, but he gets no cost share on the tiling. I started tiling thirty years ago and there is more to be done now due to more extensive farming than when I started.

I would like to point out when ACP started, in some areas they were paying 50 percent of the cost of tiling. Our organization did some research on the end results of several farmers in eastern Iowa. It was discovered that the government received its 50 percent back in taxes in three years due to the increase of income directly related to increase of production on the land that was tiled.

Our 556 watershed programs although very good in intent, takes thirty to forty years to implement and are being used as political footballs. These projects should be completed within ten or twelve years at maximum, or not approve them in the first place if money is not going to be provided.

Money is not the total answer to our conservation ills. It will take more trained SCS personnel to see that the measures are properly carried out.

I appreciate the opportunity to present to you our views on the urgent need for accelerated conservation.

STATEMENT OF ELMER E. HEIMERMAN, DIRECTOR, DELAWARE COUNTY ASCS OFFICE,
U.S. DEPARTMENT OF AGRICULTURE, MANCHESTER, IOWA

The Delaware County ASCS COC committee would like to suggest the need for more performance on conservation cost-sharing in 1977. The producer's interest in increasing his farming operation has led to an increase in land sales. Our land in Delaware County is currently 60% in the production of row crops as new soil has been broken up and brought into production to lower the farmers cost per acre in row crops. More farms in Delaware County should participate in soil conservation programs and the COC committee feels priority should be given to contour planting and stripcropping as measures to control the loss of topsoil in our area. Also, lime practices should not be abandoned. An increase in cost-sharing percentage would permit more farmers to participate in seeding down land to grass and protecting loss of soil.

No one from our Delaware County ASC committee will be able to attend the hearings.

Thank you for your interest in our opinions.

STATEMENT OF FLOYD COUNTY SOIL CONSERVATION DISTRICT COMMISSIONERS,
CHARLES CITY, IOWA

Realizing there are many problems with the present soil conservation programs, especially with "taxpayer understanding" of funding, we would like to submit a few recommendations that might produce a better understanding and also promote much needed conservation projects with possibly better use of funds.

(1) We believe there should be a program of long-term, low interest loans for qualifying conservation work. This is necessary because of the slow recovery time for this work. Many farmers never are repaid for this work during their lifetime.

(2) Our particular S.C.D. office could use more personnel, not necessarily highly paid (they could be trained for *some of this work on the job*).

(3) Long range conservation plans should be encouraged as they spread the workload and financial burden over several years and are more appealing to landowners.

(4) Any funded conservation plans should take into consideration the whole Hydrological Unit, thereby eliminating "piecemeal" or ill-conceived projects.

STATEMENT OF RICHARD L. HANDY, PH. D., DIRECTOR, SOIL RESEARCH LABORATORY, ENGINEERING RESEARCH INSTITUTE, IOWA STATE UNIVERSITY, AMES, IOWA

1. I wish to call particular attention to a subject that may be somewhat peripheral to the direct concerns of this Committee. This is the major difficulty—the subject appears to be peripheral to the concerns of every government agency we have contacted.

2. I refer to a problem that is obvious to travelers and residents in rural areas—road dust. Attached is a paper, "Unpaved Roads as Sources for Fugitive Dust," based on measurements made by engineers from Iowa State University. Pertinent information from that paper, which was recently published in Transportation Research News, is as follows:

2.1. The average production of dust by erosion from unpaved roads is 1 ton per mile per year for every vehicle per day traffic. Thus a moderately travelled unpaved road carrying on the average 30 vehicles per day will generate 30 tons of dust per mile per year! This is more believable in terms of the dust generated from an individual passing vehicle, which amounts to about 5 pounds for every mile travelled on unpaved roads.

2.2. About one half of the dust is pulverized road metal, mainly limestone, and the other-half is soil.

2.3. This measured loss of limestone as dust closely coincides with the amount of limestone added to unpaved roads in the U.S. each year, about 15 tons per mile, or a total of 50 million tons per year.

2.4. The total production of road dust is about twice the total annual production of fly ash in the U.S., yet the bulk of the fly ash is collected and not allowed to disperse in the air.

2.5. Iowa experimental road test data show that road dusting can be reduced by a factor of 10 or more by proper use of small amounts of environmentally compatible by-products such as lignins from the paper industry, with very substantial savings to the taxpayer. (The reasons this not widely done are discussed later.)

2.6. About 60 percent of the road mileage in the U.S. is unpaved: Paving all roads is not the answer—it is far too expensive. Paving is a means to provide structural integrity where warranted by heavy traffic, nominally in excess of 300 vehicles per day.

3. People not having direct and prolonged experience with the road dust problem tend to consider it as little more than a nuisance. I believe this dust poses a serious health and economic problem, but one that is technically solvable and readily amendable to controls. First, the problem:

3.1. From one-tenth to one-half of the road dust appears to settle on the public right-of-way, i.e. in the road ditches, where it contributes moderate amounts to stream pollution but for the most part remains behind to be eventually removed by ditch clean-out procedures.

3.2. Most of the dust is distributed in progressively decreasing fallout amounts farther from the road source. Thus the productivity of the portions of fields close to roads is often reduced because of dust and excess calcium.

3.3. Air-borne dust is a cause and aggravation of serious respiratory health problems, in particular asthma and other allergies, and in the southwest U.S., coccidioidomycosis (Valley Fever), which is sometimes fatal. In severe endemic areas (southern Arizona and New Mexico) over 50 percent of the population is or has been infected. The source of the disease is bodies of infected dead animals, many of which are killed on roads.

3.4. Air-borne dust is a useless and harmful expenditure of a valuable non-replenishable natural resource, limestone.

4. Because of the serious nature of the road dust problem, an extensive brochure was prepared by the Iowa State University Engineering Research Institute in the early 1970's and personally introduced to members of Congress

and the Executive Branch, in particular DOT, HUD, USDA, HEW, and other federal agencies. The brochure proposed to attack the problem through establishment of a National Environmental Road Lab to actively research, recommend, and promote the use of dust abatement procedures across the U.S. Congressional support was obtained from Culver, Swengel, Miller and Hughes from Iowa. The response of federal agencies was enthusiastic but "not our area of responsibility," and a strong and broad enough base could not be generated for any reasonable hope of action by Congress. The project was shelved.

5. The most frustrating aspect is that the materials and expertise are presently available to solve this problem; furthermore activity unquestionably would generate development of new and better solutions. Yet the field is dormant—why? Let me speculate:

5.1. One major deterrent may be that the required road improvements for the most part must come from annual appropriations of county maintenance funds at the discretion of a Board of Supervisors or equivalent local agency. Thus it is difficult to obtain agreement to allocate for a long-range effect even though it will save money—it takes an aggressive and progressive supervisor, county engineer, or other individual to not go along as in the past and spread some more rock every year without even wondering where it all goes, when one could add both rock and stabilizer and hold the road for 5 years. Where state funds are involved the state agency must approve the design, but is not closely enough concerned to actually encourage or recommend required innovative procedures.

5.2. A second factor, in some cases, may be the local limestone interests themselves; certainly a reduction of dusting even by a factor of two would not be good for sales.

5.3. A third cause may be the relative lack of political activism of rural communities, the stoicism to suffer in silence or at most complain to the Board, which reacts to the individual complainer, not the general problem.

5.4. Fourth and most susceptible to remedy, there is no viable state or federal incentive to do anything about the road dust problem. What is needed is not regulation—present environmental regulations are such that to drive on an unpaved road is to break the law. Such decrees are unenforceable and do not go to the source of the problem—although if enough dusty roads were closed we probably would see some truly violent reactions, mostly against government. Instead of hand slapping, some positive direction and incentives are needed. The DOT-FHWA says it has no jurisdiction; the USDA-Forestry Service is vitally interested but only from the standpoint of the severe dusting problems from roads within its jurisdiction; HEW is interested mainly in terms of its regulatory function. Commercial interests are marginal since the products which would be used must be cheap, i.e. byproducts, and no single producer can afford an extensive research-education-promotional program for alternative utilization of a product for which he already has some kind of use. (Most lignin is now used as fuel—an incredible demise for these complex, soluble chemicals. Furthermore this relatively slight economic incentive plus water pollution controls, have prompted paper manufacturers to turn to processes whereby the lignin is used as fuel. Here is an example of a byproduct not utilized productively, and therefore gradually being lost to a less productive use. Yet lignin is a safe chemical, slowly biodegradable and used as a glue in pelletized animal feed.)

6. In summary, I bring to the attention of the Agricultural and Forestry Committee a problem that touches in areas of health, soil conservation, transportation, environment, and natural resources—a problem so familiar and ubiquitous that no single branch or agency appears interested in dealing with it—a problem that therefore not only remains but intensifies as road traffic increases.

VITA

Dr. Richard L. Handy has been involved in research on eolian dust and wind-derived soils for many years. In addition to the attached paper on road dust his recent published articles include, "Loess Distribution by Variable Winds," in the Bulletin of the Geological Society of America, June 1976, and "Collapsible Loess in Iowa," in Proceedings of the Soil Science Society of America, Mar.-Apr. 1973.

[From Transportation Research News, No. 60, autumn 1975]

UNPAVED ROADS AS SOURCES FOR FUGITIVE DUST

(By R. L. Handy, J.M. Hoover, K. L. Bergeson, and Darwin E. Fox*)

In spite of an apparent sweeping abundance of paved roads, the majority of the roads in the world remain unpaved. For example, more than 3.4 million km or 55 percent of the roads in the United States alone are unpaved.[1] Although unpaved roads usually carry fewer than 100 vehicles per day (vpd), they are as necessary as high-volume roads and are essential for the transportation of many important resources, including agricultural products, timber, and minerals. Their low traffic volumes, however, often do not justify the cost of paving.

Unpaved roads are a source of airborne dust, which can cause discomfort, aggravate respiratory ailments, and create a driving hazard. Few attempts have been made to measure or characterize the dust from unpaved road sources. This paper presents preliminary data on the amount, distribution, and mineralogy of dustfall near several unpaved roads.

Most unpaved roads are surfaced with crushed stone or gravel for interlocking stability during adverse weather conditions. The aggregate usually is spread on the road, mixed, and occasionally smoothed with a blade grader or maintainer. A higher type, more permanent road results if the aggregate is proportionally mixed with soil and then spread and compacted. The clay in the soil-aggregate road acts as a binder. Macadam is still a higher type of road. It consists of a carefully proportioned mixture of crushed stone and fines and is used most frequently as a base for bituminous concrete paving.

All unsurfaced roads require occasional grading to fill holes and cut away raveling or "washboarding" caused by resonant bouncing of vehicular wheels. They also require periodic additions of stone. This should be an indirect measure of the amount of dusting, although a common assumption is that the stones are knocked into the roadside ditch. Periodic ditch cleanout is also required to maintain drainage, and the material cleaned out is mostly fines with only minor amounts of stone or gravel. About 50 millions tons of stone are added annually as surface treatment to roads in the United States [2], an average of about 15 t/km/year.

DUST COLLECTION

Dust collectors were set along lines transverse to the centerline of 10 unpaved roads and test sections in Poweshiek, Story, and Linn counties in central and eastern Iowa. The collectors consisted of straight-sided plastic cans 15.2 cm in diameter and 19 cm deep mounted approximately 1 m above ground level on steel stakes, as specified in ASTM D1739-70. Sampling sites were selected in vegetated areas to reduce contamination. At each site, the collectors were spaced at 3- to 150-m intervals along traverses from both sides of the roads. The containers were half filled with distilled water and were checked and refilled at least once a week. After a period of 3 to 4 weeks the collectors were sealed and brought to the laboratory. The insects and chaffe were removed by hand, and the samples were treated with 0.3N H₂O₂ acidified with HCl to further remove organic matter. Samples were then dried at 110 C and weighed. Mineralogical analyses were performed by simultaneous differential and thermogravimetric analyses and by polarizing microscopy and X-ray diffraction; particle size analyses were done by dry sieving.

DUST DISTRIBUTION

All sampling traverses showed the same trend: The closer the container was to the road, the more dust was collected in a given time. Plotted on a linear scale, the curves are almost asymptotic adjacent to the road, but plotted with distance on a logarithmic scale, 2 straight lines result, as shown in Figure 1. Similar distribution trends have been found for loess, a widespread silt deposit usually attributed to wind deposition leeward from glaciofluvial river bar sources [3]. The reciprocal of loess thickness also empirically has been found to increase linearly with distance [4]; this relation describes a hyperbola. For present purposes, a semilogarithmic plot offers several advantages: Extrapolation may be made to 0 contribution from the road source, which is more in keeping with the data since a 0 contribution was sometimes found; the total amount of dust de-

*The authors are associated with the Soil Research Laboratory of the Engineering Research Institute, Iowa State University.

posited may be more readily calculated by integration of the area under the curves; and a correction for atmospheric dust may be made by simple subtraction.

ATMOSPHERIC DUST

According to the data from comparable dustfall sampling away from secondary road sources [5], the average atmospheric dust deposition in the study area should be of the order of 45 to 50 kg/ha/month, multiplied by a factor of 0.4 to 0.9 for reduced dust deposition during the autumn, reflective of more complete agricultural ground cover. These data coincide rather closely with present measurements of 32.2, 32.7, 33.3, and 30.2 kg/ha/month in the 4 most distant containers along roads treated with a chemical dust palliative. A value of 32 kg/ha/month is therefore assumed to represent an atmospheric base line for calculation of road dust distributions.

ROAD DUST

The intersection of the 2 linear relationships in plots of amount versus log distance (Figure 1) was always at a distance of about 10 to 12 m, coinciding rather closely with the usual secondary road right-of-way of 10.06 m measured from the centerline. The higher deposition of dust in the right-of-way may relate to geometric and vegetation factors and the fact that deposition continues to occur close to the road even when there is no distributive wind other than that generated by traffic. This is in contrast to wind erosion and deposition in nature, which obviously can proceed only when wind is blowing. The road dust was therefore considered in 2 categories—roadside and distributed—and the amounts were calculated in 2 separate integrations.

Representative results are given in Table 1. Data are given for 3 limestone surface-aggregate roads and 4 mixed-in-place soil-aggregate road test sections. The Poweshiek road was singled out by the county engineer for having experienced an excessive loss of aggregate during the years; our data indicate an annual dust amount of more than 650,000 kg/km of which half, or 325,000 kg/km, was limestone. The Story and Linn roads were qualitatively selected as more typical and yielded similar amounts when expressed on a vehicle-per-day (vpd) basis. The dust loss averaged 568 kg/km/vpd/year, of which mineralogical analyses again indicated about half was limestone.

TABLE 1.—SUMMARY OF DUST AMOUNTS

Roads	Limestone (kg/km)	Total dust (kg/km/ month)	CaCO ₃ (percent)	Dust per vehicle per day (kg/km/ year)
Surface aggregate:				
Poweshiek.....		56,640	50.0	4,370.0
Story.....		4,680	(¹)	534.0
Linn ²		7,535	46.0	603.0
Soil aggregate:				
Sec. 3.....	225,000	434	28.0	61.0
Sec. 2 ²	225,000	256	1.1	36.0
Sec. 6 ²	564,000	207	5.4	29.0
Sec. 10 ²	1,015,000	70	33.7	9.9

¹ No data.

² Calcium lignosulfonate (lignin) liquor added as a surface treatment or as 1 percent addition to the mix.

Only the Poweshiek road data showed a major influence from prevailing winds, and data for the other roads were therefore averaged from containers on both sides. Although total amounts of dust determined on both sides of the Poweshiek road differed by a factor of 7, the roadside component on the 2 sides was practically identical, lending credence to the suggestion that the major deposition of roadside dust occurred when there was no wind. From other roads, the amount of roadside dust varied from 1200 to 12,000 kg/km/month, constituting 6 to 50 percent of the total dust.

Similarly, extrapolation of the semilogarithmic plots indicated maximum distances of deposition measured from centerlines were quite variable, ranging from 60 m for the Story road to 2500 m for the prevailing leeward side and 400 m for the prevailing windward side of the Poweshiek road. Even the 2 roads that produced nearly identical total dust amounts showed large variations in distribu-

tive geometry, the amount being deposited as roadside dust differing by a factor of 10 and the maximum distance carried differing by a factor of 15. This is not surprising for a system in which the source is a constant while the distributive mechanism varies. For example, the Story road, where 50 percent of the dust was roadside and all fell within a distance of only 60 m from the centerline, is a suburban feeder on which traffic is concentrated in the morning and evening hours when there is less wind.

DUST COMPOSITION

The percentage of carbonates, determined microscopically and more precisely from weight loss in thermogravimetric analysis, varied from 75 to less than 1 percent, generally decreasing with increasing distance from the road [6]. Responsible factors probably include particle size and specific gravity sorting, for the carbonate particles tended to be larger and more dense and therefore settled out faster and concentrated closer to the source.

Clay mineral identification was difficult because of the small amounts of clays in the samples. A degraded illite was found in samples close to the source, reflective of clay in the limestone. Smith et al. [5] comment on their unexpected encounter with kaolinite in atmospheric dust samples and the unaccountable scarcity of montmorillonite. This is reasonable if road-pulverized stone is a major contributor to atmospheric dust.

Dry sieving of the Poweshiek road dust samples indicated more than 70 percent of each sample was retained on the 0.053-mm sieve and classified as fine sand. The median grain size varied from 0.06 to 0.12 mm, with a tendency toward finer particles farther from the source. The median size was somewhat larger than that previously reported for atmospheric dust [5, 6]. Other samples were not sieved because of the small amounts and susceptibility to error.

SOIL-AGGREGATE ROADS

The effectiveness of several treatments to improve road surfacing and reduce dusting is indicated by measurements made about a year after construction (Table 1). Simply adding aggregate and mixing it in rather than leaving it on the road surface would appear to reduce dusting by a factor of 10, which agreed with qualitative observations. Addition of 1 percent lignin, a nontoxic by-product from paper manufacture, further reduced dusting by one-half; only a short-term benefit was obtained when lignin was used as a surface treatment.

The carbonate data indicate that lignin treatment preferentially held the limestone, probably because of clay migration to the road surface during wet weather, and formed an observable brown protective patina. Unfortunately, this patina also makes the roads slippery in wet weather, but the use of more limestone reduced this factor and also rather surprisingly decreased the dust, suggesting that mechanical stability and low dusting go together. Certainly the fact that a road is unpaved does not mean that it must be a major dust source. The best road lost rock at the rate of 3.3 kg/km/vpd/year, and the worst road lost 2185 kg/km/vpd/year or more than 600 times as much (Table 1). Furthermore, the amount of stone used to construct the low-dusting road, slightly more than 1 million kg/km, just equals the amount of rock lost from the worst road in 3.1 years. This would appear to be a strong economic as well as environmental argument for improving aggregate-surfaced roads by mixing aggregate and stabilizing agent even though the treatment might have to be repeated every 5 years.

DUST PRODUCTION VERSUS STONE CONSUMPTION

As previously mentioned, annual consumption of crushed stone in the United States for surface treatment of roads, not including stone used in macadam or road-base construction, is about 15 t/km. If we assume that 80 percent is used as replacement for existing aggregate and divide this amount by the amount of carbonate lost from the Story and Linn roads, 280 kg/km/vpd, we obtain an annual average traffic count of about 40 vpd on all unpaved U.S. roads, not an unrealistic figure.

REFERENCES

1. Federal Highway Administration. Highway Statistics 1971. U.S. Government Printing Office, 1971.
2. U.S. Department of the Interior. Minerals Yearbook. U.S. Government Printing Office, 1971.

3. G. D. Smith. III. Agriculture Experiment Station, Bulletin 490, 1942, pp. 139-84.
4. R. V. Ruhe. Quaternary Landscapes in Iowa. Iowa State Univ. Press, Ames, 1969.
5. R. M. Smith, P. C. Twiss, R. K. Krauss, and M. J. Brown. Soil Science Society of America, Proc., Vol. 34, No 1, 1970, pp. 112-117.
6. J. M. Hoover et al. Surface Improvement and Dust Palliation of Unpaved Secondary Roads and Streets. Engineering Research Institute, Iowa State Univ., Ames, 1973.
7. R. L. Handy, C. A. Lyon, and D. T. Davidson. Analyses of Wind-Blown Silt. Iowa Academy of Science, Proc., Vol. 61, 1954, pp. 778-790.

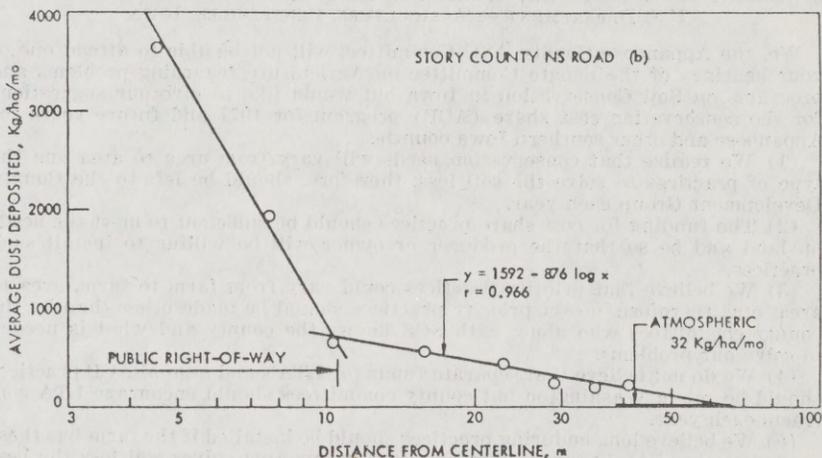


Figure 1. Rate of dust deposition versus distance to the road centerline. Data were averaged from both sides of the road and plotted on a logarithmic scale.

STATEMENT OF ALLAN L. SEIM, COOPERATIVE EXTENSION SERVICE, IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY, OTTUMWA, IOWA

Please accept my apology for not responding more quickly to your letter in regard to the soil and water conservation field hearings. Such hearings should be a good way to collect new ideas and additional information.

I agree with your thoughts that soil and water conservation are priority items deserving attention from everyone. I also feel that much of the general public needs a better understanding of farming before it will take a positive interest in solving soil and water conservation problems, particularly if public subsidies are involved, (and I think they must be). Some "facts of farming life" that the general public seems to overlook on occasion are:

- (1) Farmers also use food and also buy most of theirs at grocery stores.
 - (2) Nearly all food comes from the land, not the grocery store.
 - (3) Land protected from soil erosion will better maintain its productive capacity and will solve two problems, 1) soil erosion and 2) reduced water quality (since our main water quality problems are caused by eroded soil and the fertilizer and pesticide chemicals that may be attached to it).
 - (4) Land protection measures such as terrace systems and erosion control structures are expensive and the economic return on such investment is generally quite low.
 - (5) Perhaps the least understood "fact" is that the agricultural marketing system does not provide farmers with an opportunity to "pass on" the cost of conservation practices as most any other business can "pass on" its additional costs.
- Point five seems to me the best argument for public participation in the cost of land protection measures. If the public understands that situation, I think it would be more apt to view public expenditures for conservation practices as an investment. Continued public "investment" in permanent conservation practices

seems necessary to get continued and increased adoption of such practices by farmers.

Even with public assistance, some farmers will not make the investment for practices such as terraces, and some fields are not well suited for terraces. Some other approach to erosion control is needed in such situations. Conservation tillage systems may often provide adequate erosion control. Adoption of such tillage systems has been relatively slow in southeast Iowa and continued research and educational efforts are needed to enhance their use in this area.

STATEMENT OF V. C. KASTER, CHAIRMAN, APPANOOSE COUNTY ASC COMMITTEE,
U.S. DEPARTMENT OF AGRICULTURE, CENTERVILLE, IOWA

We, the Appanoose County ASC Committee, will not be able to attend one of your hearings of the Senate Committee on Agriculture regarding problems and programs on Soil Conservation in Iowa but would like to give our suggestions for the conservation cost share (ACP) program for 1977 and future years for Appanoose and other southern Iowa counties.

(1) We realize that conservation needs will vary from area to area and the type of practices to solve the soil loss, therefore, should be left to the County Development Group each year.

(2) The funding for cost share practices should be sufficient to meet the needs on land and be so that the producer or owner will be willing to install such practices.

(3) We believe that priority practices could vary from farm to farm, area to area, etc., therefore, no set priority practices should be made other than by the county committees who along with SCS knows the county and what is needed to solve our problems.

(4) We do not believe that separate funds for LTA's and annual ACP practices should be set in Washington but county committees should encourage LTA contracts each year.

(5) We believe long enduring practices should be installed if the farm has these needs but also 4 to 6 year seeding practices in our area solves soil loss the best for dollar cost share invested.

(6) We feel that 1977 will again be a heavy request year for cost sharing on conservation practices and due to the rising cost of installing such practices more funds will be needed if all requests are approved.

(7) The 1977 cost share program (ACP) should be developed, funded and out to the counties by January 1, 1977.

(8) We realize that the Budget Department will request a hold down on funds but we feel that this program has so much at stake for the present and future and the cost of conservation should be shared by all people not just the producer or land owner. We cannot continue to produce what is needed and not conserve our natural resources. Therefore, we must cost share with the producer or land owner to get the needed conservation practices on the land to stop this water and wind erosion.

STATEMENT OF AL SWEDE, FARM EDITOR, CEDAR RAPIDS GAZETTE,
CEDAR RAPIDS, IOWA

There can be little debate over the need for an increased soil conservation effort nationwide, but there can be considerable room for debate over how soil conservation funds are spent.

The loss of rich topsoil in just one century in Iowa has been nearly as great as the loss of topsoil in China, for example, where the land has been farmed for over 20 centuries.

In addition, conservation work must be drastically stepped up to meet the nonpoint pollution standards indicated in recent Environmental Protection Agency goals of clean water by the year 1981.

I would like to share with you six observations which I feel should be included in future soil conservation legislation:

(1) My main concern is that soil conservation funding has become a "ceiling" on the amount of work done in individual areas.

Originally the soil conservation program was started to act as an "incentive" to encourage farmers to conduct further work in the countryside, but that incentive largely has dwindled as more and more farmers have refused to do soil work unless funds are available.

Since funds are not available on a large scale, the soil conservation movement has been stymied by the amount of funds which are available. This was not the original intent of the law.

To counteract this growing attitude, funds need to be appropriated to point out the management benefits they gain through conservation projects. This means more money should be appropriated for education programming in conservation.

In addition, research funds need to be appropriated to land-grant institutions to develop new and improved techniques of saving our nation's valuable topsoil. Iowa State University, for example, is planning research in this area.

(2) Landowners who are in the farming occupational category should have first priority in the allocation of soil conservation funds.

Outside investors in agriculture have ample incentive already to adopt soil conservation practices. The booming real estate market more than offsets the cost of installing major soil conservation structures.

In addition, the outside investor gains considerable tax leverage by channeling off-farm income through farm tax breaks. The installation of soil structures enhances this tax mechanism, because the investor can claim an investment tax credit on the installation of the project.

If soil conservation is indeed considered an "incentive" program, it would seem logical that the funds are not needed for outside investors who need no additional "incentive" for the adoption of soil conservation practices.

A provision could logically be written into the law to allow such aid in cases where the outside investor intends to maintain a longtime relationship with a renter on his property. In that situation, the landowner would not benefit from the sale of property, and a farmer would benefit from a "farm" program.

Opponents of this idea charge that erosion occurs on farms owned by farmers as well as nonfarmers, and the need for conservation measures on both places is equal. This is true, but the soil cost-sharing program was established as an "incentive" for further soil work. Since priorities need to be placed on the limited funds, it would seem logical that this is one good way to make the funds go further.

Opponents also argue that such a measure would turn soil funding into a "welfare" program. This is not true, since the intent is to turn the soil program into a true "farm" program. If such action would result in a "welfare" program, officials should consider whether the present plan is a "welfare" program with benefits going to the rich and the poor alike.

The incentive for fulltime farmers to adopt soil practices is not so readily apparent as for outside investors. Farmers frequently hold their land in the family for generations, so they are not likely to sell their land to benefit from the increased land values resulting from the adoption of soil conservation techniques.

Both farmers and outside investors benefit from the tax advantages written into law, but farmers do not have access to the outside capital sources which non-farm landowners can draw on to finance the soil projects. As a result, farmers need additional incentives to borrow the funds needed to meet the added debt load on their farm.

(3) A strong case can be made for soil funds to be given to low-income farmers on a priority basis, because of the budget restraints placed on soil funding in recent years.

The need for soil conservation measures is often the greatest on low-income producing farms where erosion has literally eaten away the farm family's livelihood. The farmer often does not have the economic resources needed to meet the present cost-sharing provisions of the soil program.

For this reason, society should consider paying the full conservation bill on such farms in order to make the farm a viable economic unit. Perhaps the low-income farmer can be given a low-interest loan to meet his portion of the cost-share payment.

(4) Some farmers refuse to accept soil cost-sharing money on grounds that such money is a form of welfare. I recall that my father adopted a number of soil conservation practices on his farm but refused to accept soil aid for the work for this reason.

One way to stretch limited soil conservation money is by developing a long-term low-interest loan program. This would provide two benefits: a) It would stretch the amount of money available for soil conservation and b) Farmers who consider soil money as a form of government handout would participate.

(5) Policymakers associated with the soil program should not be eligible to participate in the program.

As you recall, Sen. Clark, you have been a leader in the Senate to remove potential "conflict-of-interest" situations from the grain inspection business. You have sought legislation to prohibit employes of grain firms from serving on boards supervising licensed grain inspection agencies.

The same philosophy applies here. Cost-sharing funds are given to farmers as a free grant to be matched dollar-for-dollar on conservation projects.

As a result, the public trust is greater in the allocation of these funds. A conflict of interest clause in any new soil legislation would go far in protecting the soil program's reputation and limiting the current attacks on the program as the "rural congressman's pork barrel."

Another federal agency, the Farmers Home Administration (FmHA), has strict rules prohibiting FmHA policymakers from receiving loans from the agency. In some instances, employes and committeemen can receive loans if they have approval from a neutral higher board.

A similar provision can be added to the Agricultural Stabilization and Conservation Service handbook procedures, since the ASCS funds involved are grants, which, unlike loans, do not have to be repaid.

(6) Although your hearing deals exclusively with soil cost-share funding, I would suggest that you consider an increase in the funding authority for farmers to cost-share the construction of livestock waste facilities.

Soil conservation funds are used to correct pollution problems which arise from nonpoint sources. Similar funds are needed to assist farmers in constructing facilities to control pollution problems arising from specific point sources.

In many cases farmers were not aware that the Environmental Protection Agency or any other governmental agency would require farmers to control pollution at the time many livestock facilities were constructed.

Rules have not been consistent in this area, which makes the need for funding all the greater. Society has an equal stake in seeing that pollution from point sources is controlled. Society has asked that this pollution be controlled, and so society should help defray the costs.

If livestock pollution cost-sharing money is made available, the money should be available only to fulltime farmers on the basis of economic need. Program policymakers and outside investors should not receive the funds, since this is designed to be a "farm program."

STATEMENT OF HOWARD P. JOHNSON, IOWA STATE UNIVERSITY OF SCIENCE AND
TECHNOLOGY, DEPARTMENT OF AGRICULTURAL ENGINEERING, AMES, IOWA

This is in response to your letter of June 2 in which you extended a personal invitation to me to attend and contribute to hearings on soil and water conservation in western Iowa, because of previous commitments, I was not able to attend. However, I am very interested in the subject of soil and water conservation and its place in national priorities. The preservation of our renewable land and water resources is very important to our nation. It will take many years to complete the actions required to assure that these resources will be preserved. We should be moving ahead quickly.

The broad-scope problem of soil and water conservation has three aspects, namely, physical and biological, economic, and institutional. Several approaches to the physical and biological aspects of the conservation problem have been suggested over the years, namely, rotations, contouring, and terracing. One approach to soil and water conservation that has been relatively well received in western Iowa is the planting of corn and soybeans with the residue left on the surface (mulch tillage). Research indicates that this practice markedly reduces erosion, however, several questions remain to be answered if the practice is to be extended to other areas. Research is needed to determine whether leaving the residue on the surface will induce increased disease and insect problems, decrease early-season soil temperatures or result in poor weed control. Further research, development and education efforts are needed to assure that this practice is widely adopted if it is practical. While terracing is often sold on the basis of economic feasibility, there is considerable question in my mind whether there is a return on the investment for the farmer, at least for the short term. Terracing certainly does not increase crop yields, and often decreases yields. On the other hand terracing does provide erosion control and maintains a farmable land surface.

As is the case in any action of this kind there are three ways of getting the job done, namely, education—to teach an ethic, provide incentives, and regulation. I assume that we will use a combination of the three over the long term to accom-

plish the task. In the near future there will be increasing conflict between production goals and environmental control goals. The Iowa Soil Conservation Law is beginning to impinge on the problem. Some questions that need to be faced squarely are: What capital inputs should be expected from the farmer for erosion and non-point pollution control? How do you convince farmers operating on large tracts with modern machinery that soil erosion is a problem, at least in the long term, and that they should tolerate some inconvenience and possible cost to control erosion?

I have enclosed the following publications for your review:¹

1. "Land Resource Use and Protection," by the Council for Agricultural Science and Technology,

2. "The Effect of Man on Water Yield, Peak Runoff and Sedimentation," by H. P. Johnson, K. E. Saxton, and D. W. DeBoer, and

3. "What is Happening to our Soil Resources?" by W. D. Shrader.

There are many publications related to the problem. Several are listed in the above papers.

As I view the subject of soil and water conservation, the most difficult questions to answer are those related to the economic and institutional aspects. Since action on soil and water conservation in terms of time is probably not as crucial as that needed to meet the energy problem, we may be able to learn something from the national approach to the energy problem. Erosion of our food production base is more subtle in its impact than the depletion of our petroleum base. However, the consequences are just as certain, but will be distributed over several generations.

I appreciate your invitation to participate in the hearings. If I can be of service in the future please write or call me.

STATEMENT OF W. D. SHRADER, PROFESSOR, DEPARTMENT OF AGRONOMY, IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY, AMES, IOWA

EROSION IN WESTERN IOWA A UNIQUE PROBLEM

Nowhere else in the United States and in the world is there such an expanse of productive soils combined with a temperate climate as in the state of Iowa. It is this combination of soils and climate that makes Iowa a leader in agricultural production for domestic and worldwide consumption. How long this will continue will depend largely on the continuation and attenuation of effective soil and water conservation programs designed simultaneously to protect the integrity of our soil resources and maximize food and feed production. Soil erosion occurs in varying degrees throughout the state depending on soils and topography. The following comments focusing on western Iowa are not meant to imply that erosion is not a serious problem in other parts of the state, but rather to emphasize the severity of the problem in this area.

The loess hills of western Iowa are a unique natural resource. The deposits of silty soil material which cover some 5 million acres in Iowa and are more than 100 feet thick in places, give this part of the state its rolling topography and high productivity. They are also the reason for the high rates of soil erosion that occur throughout this area.

The erosion problem is unique because this deep loess area is one of the few soil areas in this country in which erosion rates in excess of 20 tons per acre per year can occur on land that produces, and keeps on producing high yields of corn and soybeans.

Numerous studies on these soils document that average corn yields in excess of 100 bu/a are obtainable on severely eroded soils and on soils that are actively eroding. There are few places in the world where this is true. Most soils lose most of their productive capacity or become extremely expensive to farm when eroded.

Erosion is a problem mostly on sloping lands that are used for row crops and as the row crop acreage is increased the erosion hazard also increases.

The large increase in row crops in this region in recent years is obvious to any observer. The uniqueness of the soils and climate that make this increase desirable from the standpoint of the farmer are not so readily apparent. In most soils of the United States and of the world, soil erosion exposes a subsoil which is

¹ The above-mentioned material is retained in the committee files.

highly unfavorable for crop growth. In most cases, the exposed subsoil is not only low in plant nutrients, but is acid, heavy in texture or is stony, or low in water holding capacity or is extremely difficult to till. Thus, when eroded, these soils are no longer profitable to till and revert to pasture or forest.

Loss of the surface soil on the deep calcareous silty loess deposits of this region, results in loss of plant nutrients, particularly nitrogen and phosphorus and the subsoil is somewhat more cloddy and hard to work than the surface. However, when nitrogen and phosphorus are furnished in any available form; in manure, compost or as a chemical fertilizer, yields are as high or almost as high on the eroded as on the uneroded areas. Thus, while costs may be slightly higher and yields slightly lower, on eroded as compared to uneroded lands, the net income of the farmer on the loess soils is maximized by maximizing corn and soybean production.

Most farmers are aware of and concerned about erosion, but the only way they know to pay off the mortgage and pay for the constantly rising costs of all aspects of farming and of living is to grow corn and/or soybeans; all they can.

Silt filled reservoirs, polluted streams and gullied hillsides bear witness to the damages caused by erosion. The problem is unique and serious. Several procedures are known that will prevent erosion losses on these soils. The control measures are costly in terms of capital investments, such as for terraces or costly in terms of drastically lower incomes as occurs when the land is returned to less intensive use such as hay and pasture or forest.

Removal of the sloping land from cultivation would be costly to the area, state and nation in terms of reductions of grain available for use or export. Costs of erosion control will be high by any known procedure. If control is by edict, the immediate cost will fall mostly on the farmers and many would be bankrupt by such a procedure. Control by subsidy would be costly to the taxpayer but would not necessarily reduce the production of wealth.

Several new tillage methods are being studied that furnish some measure of erosion control—that produce less erosion than conventional systems. None of the really effective tillage methods have received widespread farmer acceptance because of added costs or anticipated lower returns or a change of familiar methods of production.

Most past research in crop production has been conducted under conventional tillage. In many instances, crop varieties, pest management methods, and fertilizer recommendations developed from such research cannot be applied directly without penalty to these emerging new tillage methods. The development of new technology needed by the farmers can be generated through the implementation of a vigorous research effort. Expanded research in tillage and in a range of farming systems that would minimize erosion and maximize income are needed to furnish a base for rational decisions in the difficult area of erosion control especially on these uniquely productive soils.

The long history in Iowa of productive state-federal cooperation in agricultural research including the very valuable basic watershed research at Treynor attests to the worth of the research efforts.

RUNNELLS, IOWA, July 9, 1976.

HON. DICK CLARK,
U.S. Senator from Iowa, Senate Office Building, Washington, D.C.

DEAR SENATOR CLARK: Enclosed is a copy of a letter I am sending to the Editor of Des Moines Radio Television station WHO. Please consider it as testimony for your recent hearings on soil conservation in Iowa. Thank you.

Yours truly,

JIM MURPHY.

RUNNELLS, IOWA, July 9, 1976.

EDITOR, WHO RADIO TV: I agree with your stand that financing long term soil conservation measures is a legitimate area for public funds. However, the future of the public sharing this cost with the farmer does not lie in Congress' proven willingness to appropriate funds. It will pivot on whether or not the people who administer the programs on the local and state level will refrain from taking the first shot at the money for use on their own and their close relatives' farms. Unfortunately, this practice is not illegal. Investigations by myself, by the Cedar Rapids Gazette and by others reveal that these greedy practices prevail from top to bottom throughout the federal, state and county workers in soil conservation related activities.

No cumbersome laws attempting to prevent one group of citizens from using public funds are needed. Merely the requirement that amounts, names and addresses of all those receiving federal and state soil conservation funds be made available for publication in local and state news media. Obviously, the federal employee who is already making \$18,000.00 in salary will then think twice before taking \$20,000.00 in federal funds and \$5,000.00 in state funds for his own farm. The farm management company which siphons off 10% of the cost share money will discover that everyone knows that public funds intended for soil conservation work are being paid to the management company for asking for it. The Attorney can weigh the value of \$20,000.00 in cost share against what it means to his reputation as a self made man.

Most importantly, the dedicated employees and farmer elected committeemen who do not exploit their positions of trust will be cleared by public disclosure.

STATEMENT OF GEORGE W. HOSFELT, CHAIRMAN, CASS COUNTY
SOIL CONSERVATION DISTRICT, ATLANTIC, IOWA

Soil Conservation Districts have long taken an active and progressive role in the protection of America's soil resources through planning for and application of conservation practices on the land of farmers and ranchers. In the past almost four decades, the role of Districts has expanded to include not only private lands, but public lands as well. The Districts have accepted new programs, challenges and concepts through the years including PL-566 watershed projects, RC&D projects, and now 208 planning and future involvement in land use planning.

We as District Commissioners are aware that agricultural products produced on American farmland is of vital importance to our export markets, is in demand by overseas developing countries, and is of value to the United States balance of payments. We are also aware that U.S. agricultural production can be increased sharply by the application of technology but not without predictable, measurable risks to our soil resources. These risks will become obvious and recognizable if we do not first apply the needed erosion control measures that will keep our soils in place on the land where they belong.

We cannot logically expect the average farmer or landowner to invest the vast sums of money that will be required to get the conservation job done. For example, a complete system of terracing can easily cost \$250.00 per acre. The conclusion from this can only be that someone else must help with this cost if a solution to the already present problem of excessive soil loss is to be solved.

Consumers are landusers even though their demand is felt indirectly. Consumers demand that food and fiber be available on store shelves continuously. We demand more and more as our numbers increase and as we are joined by foreign neighbors in our markets. It only seems logical that society, at least American society, must equally share the burden of cost to protect a vital natural resource—the soil.

Currently we see no new planning starts in small watershed projects (PL-566) in Iowa. Case County alone can state that two such projects on the West Nodaway River and PACS Indian Creek have applications submitted awaiting authorization and funding to move ahead. Projects such as these accelerate protection of the land resource base since few watershed measures can be installed until 75% of the upland area is adequately protected from erosion. Recent research studies have shown that erosion losses have increased by as much as 20-22% in the last few years in this area of Iowa. However, appropriations for watershed projects, have remained the same and actually fallen back.

All out crop production without adequate conservation protection can only result in short term economic gain. The long term implications of this strategy will be disastrous not only for the next generation but for many generations to come. If we deplete our soil resources now we had better be ready to forfeit the export markets that we have developed and be ready to accept a lower standard of living and quality of our environment right here at home.

Static budgets and "hold the line" ceilings on personnel for technical and service agencies such as the Soil Conservation Service is not the way toward accelerated application of conservation practices on the land. A static budget for cost-share programs in effect is net decline while inflation insures that less can be done for each dollar invested. The conservation need requires that more trained people will be required to work directly with landowners, farmers,

ranchers and units of government if the job actually gets done. It requires that efficient programs of cost-sharing be made available dependably in sufficient amounts to support private funds with public funds.

The soil resources of the Cass District and all other Districts cannot be expected to continue to produce at the present rate and at future rates unless adequate protection measures are installed soon. Sediment is still the number one source of water contamination which only proves that soil erosion not only degrades the land, but pollutes our water as well.

The solution begins with a firm commitment that additional, accelerated measures to control soil erosion will in fact happen. Secondly, it means that the resources in terms of people, money, and education will actually be secured and committed. Lastly, it means that the effort will continue dependably until the job is done using permanent and enduring conservation measures.

We as Commissioners of the Cass County Soil Conservation District view this matter of depletion of our soil resources as one deserving of national and immediate concern and attention. All out crop production without adequate conservation protection of the land cannot be overlooked much longer.

STATEMENT OF C. W. McMANAMY, COUNCIL BLUFFS, IOWA

Thank you for affording me an opportunity to express some of my thoughts on the companion subjects of soil and water conservation farm practices and the watershed conservation program.

It has been my privilege to be closely associated with the conservation effort, not only in my own community but throughout the state of Iowa and the middle-west, for some 30 years. I was, during that time, in a position to be both objective and analytical in my observations.

Soil and water conservation practices have provided American agriculture with production tools that rank in importance right along side of such things as hybrid seed, commercial fertilizer and other like cornerstones of today's vastly improved agricultural technology.

Soil and water conservation, it seems to me, is much more even than that. These practices, for the first time in the history of agriculture, permit farmers to work in close harmony with nature as they go about their business of producing food and fiber. This in contrast to the historic practice of "wresting" these products from the soil.

It is academic to note that our land is an irreplaceable resource. It is also obvious that, for our farmers here and in the rest of Iowa, adequate moisture is the limiting factor in crop production.

To permit then both our rainfall and our topsoil to be dissipated at one and the same time becomes a luxury of waste that cannot be tolerated. Soil and water conservation farming provides the key to stemming such waste.

Conservation programs stand today as an outstanding example of practical, workable cooperation between the people, in the person of the farmer, and their government. In its relatively short history the conservation effort has made tremendous strides, strides that would have been utterly impossible without the cooperation just noted.

This is not to suggest that we can rest on our laurels. There is a great deal remaining to be done. A great deal that must, in fact, be done.

The vehicle for our conservation effort, local districts governed by local commissioners working hand in hand with federal and state agencies, provides a showcase example of democracy in action.

The watershed programs are an invaluable extension of the soil and water conservation effort. These provide an opportunity for a group of people to do together what none of them could do separately. At the same time this watershed effort materially expedites the application of needed upland conservation treatment.

In view of the foregoing, and for ever so many additional reasons I shall not take time to enumerate, may I hopefully suggest that the cause of soil and water conservation be pursued vigorously by our federal government.

May I further suggest, and I feel that this is absolutely vital to the continued success and progress of the conservation effort, that the basic control, responsibility and decision making in the conservation programs be left where it currently rests . . . in the hands of the local people in the person of their soil commissioners.

I should like to take this opportunity to commend you and your committee for your interest in this very vital subject of soil and water conservation.

STATEMENT OF JIM BOGGESE, PAGE COUNTY FARM BUREAU, VILLISCA, IOWA

Thank you for inviting my participation in this soil and water hearing.

I feel very strong that we as farmers must stop doing some of the things we are doing and start others.

First we must stop:

(1) Fall plowing of hill ground, this is causing severe wind and water erosion in much of Iowa.

(2) We must stop planting soybeans on hill ground. This so loosens the soil that the year following soybeans can see devastating erosion during a heavy rain. Since we can not control the weather, we must alter our soybean practices.

(3) We must stop planting up and down the hill including end rows on fields otherwise planted on terraced ground or contour slopes.

Now we must start and or continue:

(1) Establishing or re-establishing grassed waterways, contour grass strips, contours, terraces etc. Anything and everything to keep the soil and water where it belongs.

(2) We must encourage minimum tillage practices with the "trash" left mixed in the top few inches of soil.

(3) We need through farm organizations, Extension Service, U.S.D.A., etc. to promote red meat consumption by the American people. Our populace is ambitious, industrious and basically more healthy because of the energy supplied by red meat.

We need grass and hay back on the steeper hills; and in order for this to be economically feasible for farmers, we need a better understanding by the American public of benefits of eating meat. We have a lot of room to grow in red meat consumption, since only between 3% and 4% of disposable income in U.S. is spent for meat.

Finally let me say that government edict is not the answer. Higher price supports for feed grains and beans would encourage even more abuse of lands not suited for grains and beans.

We need in the U.S. to produce as much of everything as we can, provided it is not at the expense of future generations.

STATEMENT OF WAYNE WANGSNES, DECORAH, IOWA

I am delighted to learn that you are taking such an active interest in the very important matter of conserving our soil and water resources. I hope that you will be able to promote effective action.

Thinking it important to determine what actions might be politically feasible as well as helpful, I split a class of young Veterans that I teach at Area One Vocational Technical School in Calmar into two independent groups. Each group was told to come up with a coherent national plan to conserve soil. I think they learned quite a bit as they tried to agree on a consistent program that would be effective without being meddlesome or too expensive.

A summary of the programs they proposed follows:

(1) Both groups thought that highway planning could be improved by: (a) limits on diagonal roads; (b) cutting down the width of a highway right-of-way; and (c) greater use of existing roadbeds.

(2) Both groups suggested more government money to promote conservation practices.

(3) Both groups wanted more research into more efficient use of fertilizer, minimum tillage, and machinery.

(4) One group suggested a tax break for those farmers who use an approved rotation on their farms.

(5) One group suggested that legislation make it mandatory for a given amount of crop residue to remain on top over winter.

I thought that the suggestions of these farmers had merit, especially since they could be easily implemented and had a rather direct effect on the problem at hand. Now, I would like to submit some thoughts of my own.

First, I am of the opinion that the primary problem we should be addressing is the loss of soil through wind and water erosion. Land use planning might be nice, but, barring a very sudden and lasting explosion in the demand of food, is not likely to have a very great impact on the food supply. Structures built into the wrong place will eventually depreciate and be torn down. The loss of this land is not permanent in the same sense as it is for land ruined by erosion.

In the area of improving existing programs and rather simple new improvements my class covered the field rather well. There does seem to be a need, at least here in Decorah, for more manpower to help farmers with their conservation practices and to explain these practices to them. I wonder if the time and trouble necessary to get government help on a project do not constitute a significant barrier to many farmers. As a result much work is never done. However, I believe that there exists a significant group of farmers who for one reason or another will not use proper conservation practices until economic or government forces compel them to do so. At the present rate of change it seems probable that about two more generations must pass before this group becomes insignificant.

Considering this, and mindful of the permanent loss our Nation will suffer in the meantime, perhaps we should consider a national law based on the same principle as the Iowa soil conservation law. Basically the law I am referring to makes it illegal to lose more soil during one average crop rotation than natural processes replace. This law has the considerable advantage of directly attacking the problem without limiting a farmer to a given method of farming.

As passed in Iowa however, the law does little good. Someone has to complain to get anything done and of course no one is willing to fight with his neighbor. At a national level, it would be possible to use the ASCS organization that already exists to record the crops a farmer has on each field. They could determine whether or not too much soil is being eroded by comparing the rotation actually being used in each field to a maximum row crop rotation for that field set up by the Soil Conservation Service. The SCS would have to determine this maximum row crop rotation on the basis of such factors as slope, cultural practices and type of soil. This information is presently or at least should presently be readily available.

This plan would require a large amount of labor to get it started. However, it seems probable that a considerable amount of this labor is already hired and presently sitting in our ASCS offices. Computers could, of course, be used to make the process more manageable.

This whole program could be made more palatable to farmers if it were set up to reward compliance instead of (or in addition to) punishing those who permit erosion. Rewarding compliance would also seem to be more equitable since it would result in the nation at large helping to pay for a national benefit and the farmer getting paid a little for his extra work rather than (as would happen under a stick approach) merely saddling the farmer with more red tape. We have enough red tape now.

The resources available to me do not permit me to determine whether or not this program would be cost-effective on a national scale. One would have to determine the erosion it would be possible to prevent, place some sort of value on erosion prevention and then estimate the cost of the program. Finally, I suppose one would have to compare the benefits the American people would receive from clean water and ample food to the benefits of one more B-1 bomber or so. At that point the decision becomes political instead of economic. I would be willing to venture however that the agriculture department at Iowa State would be quite willing to do the economics (for a small fee).

Thank you very much for the invitation to the Senate Agriculture and Forestry Committee field hearings. I am sorry that I could not attend.

STATEMENT OF WINTON ETOHEN, EXECUTIVE VICE PRESIDENT, IOWA FERTILIZER AND CHEMICAL ASSOCIATION, INC., DES MOINES, IOWA

1.2 MILLION FEDERAL GRANT TO CONTROL NONPROFIT POLLUTION IN IOWA

This being that time of year when State and Federal Revenue Collectors require an accounting from all taxpayers, I believe it to be most appropriate that the question of spending some of our tax money be the subject of this Public Hearing today.

Realizing of course that the amount 1.2 million is an infinitesimal part of the total take of the Federal Government for all purposes, yet it can serve a very high and noble cause if spent for the purpose intended—Non-Point Source Pollution Control in Iowa.

It disturbs me greatly to read in the news reports concerning this Federal Grant that two agencies of our Iowa Government are vying for spending rights to this money and each has come up with their very own plan to hire 12 to 14 additional staff members to administer the program.

This to me as a taxpayer smells of the very rankest of a point source pollution waste of our tax dollars—when a perfect alternative to these plans is already in existence to do this job and it is already financed with our hard earned tax dollars.

I refer to the expertise of staff persons knowledgeable in all phases of soil and water conservation at Iowa State University and the Soil Conservation Service (SCS) with its many staff experts in engineering soil and water conservation programs for our lands.

To hire an additional staff of experts by either agency to develop a plan for this Grant is a gross waste of taxpayers money and I for one—want to be counted very strongly against this. I am also very concerned with what happens within these agencies when they continue to justify the additional pyramid of temporary staff people hired after the Federal Grant money has been spent. The history of programs such as this—is that the agency involved will then spend more taxpayer dollars to continue to justify their temporary experts as permanent staff and then the pyramid of paper shufflers we support continues to grow and multiply and with it an increasing tax burden.

I would like at this time to suggest a very simple alternative to your agency plans for spending our tax dollars so that this small portion returned to Iowa by the Federal Government, after taking out their large bite for administrative costs, is not further wasted by more of the same administrative expertise you propose.

Let us simply use this 1.2 million dollars for the total and sole purpose of controlling Non-Point Source Pollution in Iowa.

Here is one very simple plan and logical alternative that will accomplish this fact.

In this Bi-Centennial Year of our Nation, we could select a farm or farms in each county in Iowa by a random drawing and that farm or farms then serve as a model of conservation by installing those practices on that farm recommended by Iowa State University Experts and the SCS to control Non-Point Source Pollution within acceptable limits. Or better yet, do this same thing for the some 5,000 Centennial farms recently determined to be owned by the same family in Iowa for the past 100 years.

Certainly these family farms must be good stewards of the soil and this could serve as an excellent recognition of them in this Bi-Centennial Year by providing additional assistance they might need for a total conservation program to control Non-Point Source Pollution.

If my mathematics are correct—100 demonstration farms in Iowa selected by a drawing in each county—a random sample method—or some other simple means could then receive \$10,000 each towards a total Non-Point Source Pollution Control Program, or as an alternative, involve the 5,000 Centennial farms sharing equally in the 1.2 million. Each would receive \$240 towards the cost of implementing their farm conservation plan for Non-Point Source Pollution as determined by the staff of experts of SCS and ISU. Cost sharing by the landowner could be an integral part of this program.

All participation in the program to be completely voluntary. If the selected landowner did not wish to be a part of the program, merely have him sign off on a form provided and select another.

In summary, ladies and gentlemen, my point is, let us use existing facilities and personnel to spend these 1.2 million in tax dollars efficiently toward controlling Non-Point Source Pollution on certain designated farms or land areas in our state, as it was intended. These models then may be observed by everyone to serve as educational aids in the struggle to get all landholders to combat soil erosion and it's resultant Non-Point Source Pollution of our lakes and streams.

To do otherwise and pursue the plans advanced by either agency concerned will result in a gross waste of tax dollars for unnecessary personnel that will probably continue on the public dole long after the 1.2 million has been expended.

I thank you for being able to appear and present this statement as a concerned citizen of Iowa—concerned about our environment and the protection of our greatest natural resource—prime agricultural land.

I am sure you agree that it must be conserved to feed our nation today, tomorrow, and through succeeding generations. You and I are the stewards of this land—let us do everything in our power to pass it on to succeeding generations in as good or better shape than when we arrived on the scene.

Let us spend the 1.2 million tax dollars wisely and efficiently on Non-Point Pollution in Iowa.

STATEMENT OF PETER V. JACKSON III, CHAIRMAN, PUBLIC LANDS, PASTURE AND RANGELANDS COMMITTEE, NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS, HARRISON, MONT.

DEVELOPMENT OF A NATIONAL PASTURE AND RANGE IMPROVEMENT PROGRAM

It is a pleasure to appear before you today and speak to a subject of great interest to the National Association of Conservation Districts. You are familiar with the NACD and the fact that we represent approximately 3,000 conservation districts throughout the United States, 15,000 conservation district directors and nearly 2,000,000 cooperators, actively involved in the development and implementation of programs for improvement and wise use of the nation's natural resources.

Today, my comments will be directed toward a program in which NACD has taken leadership toward improvement of the nation's public and private rangeland. The final paragraph of this national resolution, passed in February, 1975, is as follows:

"The NACD earnestly advocates the development of a long-term program emphasizing pasture and range improvement on all federal, state and private pasture and rangeland. Further, NACD will join in providing leadership in developing a national rangeland and pasture improvement program. NACD should seek the cooperation and support of other national organizations, federal agencies, and private institutions in this vital endeavor."

The strong commitment by NACD to this effort is emphasized by the fact that the NACD Board, at its February 1976 meeting, changed the name of our "Public Lands Committee" to "NACD Public Lands, Pasture and Rangelands Committee." We have made numerous contacts throughout the past year and a half with individuals and organizations with an interest in range and pasture lands. This includes such prestigious organizations as The Society for Range Management, The American Forage and Grassland Council, and the Western Governors Conference on Agriculture. We have also made contacts with agencies having responsibility for administration of large areas of range and pasture lands. This includes the Department of Interior's Bureau of Land Management and the Department of Agriculture's U.S. Forest Service. We have also worked closely with the Soil Conservation Service of USDA, an agency giving a great deal of technical assistance to our soil and water conservation districts and their cooperators.

This last few months, NACD has taken the leadership to schedule several meetings in Washington, D.C., with leaders and staff of these agencies as well as representatives of the Environmental Protection Agency, Council on Environmental Quality, environmental organizations, commodity groups, farm organizations and other resource groups having an interest in this area. All who have participated or been contacted have shown a positive interest in the merits of this proposal.

Throughout our discussions, we are emphasizing the great variety and number of benefits of implementing such a program. High among these benefits is watershed improvement resulting in better water quality and quantity from pasture and range areas. We would also have a more stable and healthy wildlife population which would add to the many types of recreation and outdoor experiences available from these lands. Certainly, not the least to be expected are the benefits to rangeland users in the form of livestock grazing to produce a reasonably priced red meat product for consumers and continued support of a stable economy for livestock producing communities throughout the nation.

There are a number of programs underway, throughout the United States, directed toward improving our range and pasture lands. These include the efforts

of The American Forage and Grassland Council to promote and encourage new research and production, ideas and methods; leadership efforts of NACD through its Public Lands, Pasture and Rangelands Committee, state associations and local conservation districts toward improvement of range and pasture lands; The Society for Range Management programs to develop an improved understanding of the range ecosystem and its management, and to promote the professional development of its members in this area and improve the effectiveness of range management and the public appreciation of the economic and social benefits. Regional programs include the Old West Regional Commission's grant to the Society for Range Management to develop and implement a program in five western states to accelerate range improvement and initiate a state and regional effort to give leadership and recognition to specific range improvement needs. Studies by the Four Corner's Regional Commission indicate that rangeland development has more potential for contributing to the economy of that region than any other agriculture development possibility. The Four Corners Commission is assisting the states of Utah, Arizona, New Mexico, and Colorado, to implement range development. There are also strong range coordination programs in the states of Florida, Texas, Utah, Oregon, and my own state of Montana. A national effort would recognize and build on these on-going activities.

The importance of our range and pasture lands is generally not recognized. The extent of land use for pasture and rangeland varies—depending upon the breakdown or category used by the person compiling the information. One report states that 48% of the 1.4 billion acres of land in the conterminous United States is classified as rangeland or permanent pasture. A story on conservation of grazing land in "Soil Conservation," a publication of the Soil Conservation Service, USDA, February, 1966, listed the following breakdowns:

	<i>Millions of acres</i>
(1) Non-Federal land on farms and ranches.....	485
(2) Federal grazing land.....	242
(3) Non-Federal forest and woodland grazed.....	161
(4) Cropland regularly grazed as rotation pasture.....	65

The 1964 Census of Agriculture lists four categories of range and pasture on farms. These include (1) cropland used only for pasture; (2) improved pasture; (3) woodland pasture; and (4) other pasture, not woodland or cropland. These totals amount to 665,945,527 acres. There is land in every category in each of the 50 states. Land supporting native vegetation—rangeland, grazed woodland, native pasture—outranks other categories manifold in total and at least two to one in practically every state.

Despite their extent and importance, our range and pasture lands are considered by some to be our nation's most neglected and underdeveloped resources. Many millions of acres of forage lands are providing products and services far below their potential. These lands would have greatly increased multiple use values for man and grazing animals—if developed to their potential. I believe that a strong coordination and communication effort between all groups in this area is desirable. We are proposing a meeting, in the near future, with all key interested parties represented, to develop strategy to consider such things as a possible comprehensive national approach to improvement of our nation's range and pasture lands, including research, education, technical assistance for public and private land, cost sharing under long term agreements, and improvements on public lands. There are other options available and many of these will no doubt be discussed before a final course of action is determined. Members or staff of the Senate Committee on Agriculture and Forestry will be invited to participate.

We need a national range and pasture program to provide desirable coordination, communication and leadership. Support will be necessary for Congress for both the public and private range and pasture efforts in the areas of priority selected. NACD offers our nationwide organization of locally governed conservation districts to help implement such an effort.

We appreciate the opportunity of addressing this hearing today on this important subject.

STATEMENT OF WILLIAM H. GREINER, DIRECTOR, IOWA DEPARTMENT OF SOIL
CONSERVATION, DES MOINES, IOWA

STATEMENT ON FEDERAL SOIL CONSERVATION COST-SHARING PROGRAM

I am William H. Greiner, Director of the Iowa Department of Soil Conservation, and I want to thank you for the opportunity to present the views of the Iowa Department of Soil Conservation regarding the federal soil conservation cost-sharing program. The recommendations which will be presented in this statement are based on 37 years of working with soil conservation districts and with various federal and state agencies in administering the cause of soil conservation in the state of Iowa, as well as experience in administering a state soil conservation cost-sharing program since 1973.

The main thrust of the programs of the Department of Soil Conservation and soil conservation districts is to conserve the most valuable natural resource which this nation has—its productive topsoil. This year the nation is celebrating its bicentennial. During the first 200 years of this nation's history we have exploited many of our natural resources including forests, waters, fossil fuels, and soils. The nation's future depends on its ability to conserve its remaining resources. Changes in consumption patterns, increased productivity, and an expanded population base have eliminated much of the abundance we once enjoyed. While efforts have been made to stem further exploitation, additional programs must be undertaken.

We believe there is a need for programs that will insure the availability of cost-share funding for the establishment of long-term, permanent conservation measures.

There are more than 3,000 soil conservation districts in the 50 states, Puerto Rico, and the Virgin Islands and 17,000 elected and appointed officials of these districts administer their programs with an enthusiasm and zeal that is envied by many. Iowa has 100 soil conservation districts and 50 elected soil conservation district commissioners. In most states—and this includes Iowa—these officials serve without pay.

The success of district programs in Iowa and throughout the nation is the result of a system of voluntary action and cooperation. The 100 districts that cover the state of Iowa are prime examples of local people making local decisions. Each was established only after a local referendum authorized its formation.

Soil conservation districts are recognized as political subdivisions by Iowa law. The commissioners who constitute the district's governing body are elected on the general ballot and represent cities and towns as well as rural areas.

Iowa's soil conservation program got its start as part of a national movement in the 1930's. Creation of the Soil Erosion Service in the U.S. Department of the Interior in 1933 and the establishment of erosion-control experiment stations and watershed demonstration projects at strategic locations throughout the country were emergency actions authorized by the Congress to combat the growing menace of soil erosion.

Legislation passed in 1935 established the Soil Conservation Service (SCS) in the U.S. Department of Agriculture (USDA) and declared it to be the policy of Congress "to provide permanently for the control and prevention of soil erosion." Model legislations was then developed for states to use in the establishment of soil conservation districts. The model law was sent to all governors in 1937 and studied by state legislatures from 1937-1939. The "Soil Conservation Districts Law" was passed by the Iowa General Assembly in 1939.

The first soil conservation district in Iowa was chartered in 1940. All 100 had been established by 1952. Since their beginning, soil districts have been highly localized and have always stressed the greatest possible degree of personal participation by landowners and operators.

The primary objective of soil conservation districts is to encourage and assist with the application of needed conservation measures within the district. Their actual duties and responsibilities are many and varied. Soil conservation district commissioners hold meetings at least once each month, administer the soil loss limit regulations established by the district in accordance with Iowa law, approve applications for cost-share assistance, see that the district always has a modern up-to-date soil survey, and manage all funds, facilities and equipment belonging to the district. It is also the responsibility of the district governing body to meet with local civil and business groups to discuss particular conservation problems, maintain a long-range program for the conservation and de-

velopment of natural resources within the district's boundaries, cooperate with other districts in multi-district resource activities, and report to the public through the mass media on resource conservation needs and the progress of work being done in the district.

Districts also conduct tours and sponsor demonstration projects to acquaint the public with soil conservation needs and methods. Assistance is also provided to schools, civic organizations, and youth groups to facilitate conservation education programs in the county, including the development of outdoor classrooms, in-service training for teachers, and technical assistance with workshops, field tours, etc.

Those of us who are closely associated with conservation programs have been dismayed during the past two or three years about the funding of federal conservation programs. We have seen the phase-out of various programs which set aside acres on which no row crops were being produced and these acres were generally in grass or tree production. When the acreage reserve program was phased out these lands came back into row crop production and most of them were not adequately treated with conservation practices. As a result, during the past two or three years in this state and others the erosion problems have become quite severe. This has all come about at a time when people in all walks of life are speaking loudly for protecting the environment and making our waters fishable and swimable by 1983.

Soil conservation districts in this state have had increasing demands placed upon them by new laws and new programs. Each of our districts has a memorandum of understanding with the U.S. Department of Agriculture which, among other items, states the USDA through the Soil Conservation Service will furnish technical and other assistance to the district. However, the forces of inflation coupled with SCS personnel ceilings imposed by the executive branch have reduced the soil conservation districts' ability to respond to the growing demands for district services, which include increased conservation planning and the application of practices.

The Soil Conservation Service in the state of Iowa has lost 100 positions since 1967 due to personnel ceilings. The point can rightfully be made that if we are truly desirous of reducing the soil losses from erosion, this is not the way to accomplish the task.

This philosophy of cost-sharing on soil conservation practices has been accepted in this country for a long period of time as being desirable. Soil conservation measures installed on agricultural and horticultural lands provide broad benefits to society as well as the landowner. Cost-sharing programs on the federal and state levels must be continued and strengthened. Serious problems have resulted in the past due to the instability of funding of the federal cost-share program. It has been an on-again-off-again program and no one is ever certain if there will be a program a year from now or two years from now, or if there is, what amount of funds will be available. It is extremely difficult for districts and landowners to make any long-term conservation plans under this type of financing arrangement. The application of soil conservation practices requires long-term planning and long-term investments and there should be assurance to districts and landowners that cost-share assistance will be available.

Iowa has had a cost-share program since 1973 and it has had the stability necessary to make the program work satisfactorily. There has never been a threat by the governor or legislature to discontinue the program or impound funds but instead it has been continued and strengthened. As an illustration, the soil conservation cost-share program in Iowa was begun in 1973 with an appropriation of 1.5 million dollars for each year of the 1973-75 biennium. During the second session of the Assembly the amount was increased another one-half million dollars for a total of 2 million dollars for each year of the biennium. During the 1975-76 fiscal year 2.5 million dollars was available for soil conservation cost-sharing, and the Iowa General Assembly has recently enacted a 4 million dollar appropriation for the 1976-77 fiscal year.

It should be noted again that this program has been supported by the Governor of Iowa as well as the members of the Iowa General Assembly and it is bipartisan support.

The Iowa General Assembly in its appropriations bill has stipulated that only permanent soil conservation practices can be cost-shared. Permanent practices are defined as those practices that continue in use over a long period of time and include terraces, erosion control structures, waterways, diversions, tree planting, critical area seeding, etc.

The amount of cost-share available under the Iowa cost-share program to an individual landowner cannot exceed 50 percent of the actual cost of the practice unless he or she is mandated to construct a conservation practice to abate a nuisance under Chapter 467A.48 of the Code of Iowa (Iowa's sediment control law enacted in 1971) and this is at 75 percent cost-share rate. There is no ceiling per farm such as the 2500 dollar limit in the federal program.

The accomplishments through state funds since the program began in 1973 are impressive. The total accomplishments from July 1, 1973, to December 31, 1975, are as follows: 1,537 miles of parallel grassback slope terraces; 255 miles of all other types of terraces; 904 erosion control structures; 1,362,630 lineal feet of waterway; 3,546.9 acres of pasture and hayland planting; 48 acres of critical area seeding; 6,895 lineal feet of field windbreak; and 2.5 acres of tree planting.

More than 10,000 landowners throughout the state of Iowa applied for cost-share assistance during this period of time. A total of 6,115 were approved and funded.

It should be noted that for some of these practices there were federal funds used due to a cooperative program that was carried out through county ASC committees and districts which provided a landowner with a total of approximately 75 percent cost-share assistance with the federal program contributing 50 percent and the state 25 percent. However, this cooperative program has been discontinued and each program is operating separately at the present time with the exception of a few isolated instances.

We believe that state governments should contribute state funds to the soil conservation program such as the state of Iowa is currently doing. Many states are becoming active in this area and in fiscal year 1976 local and state appropriations for support of the soil conservation program again increased over previous funding. State funds now amount to 49 million dollars annually and local contributions are nearly 54 million dollars each year and these figures will continue to increase.

You have asked for our comments and thoughts regarding what should be done in the federal cost-share program. We offer the following suggestions with the idea that these are items needed to accomplish the enormous task of sediment and erosion control on private lands in the state of Iowa as well as the other 49 states, Puerto Rico and the Virgin Islands. The following suggestions are offered for your consideration in deliberations for formulating a federal soil conservation cost-share program:

(1) The federal program has had many different names during the past 20 to 30 years. The most recent are Agricultural Conservation Program (ACP), Rural Environmental Conservation Program (RECP), Rural Environmental Assistance Program (REAP). This continual changing of names is confusing and it is difficult for people to understand from one year to the next what program is being used.

We suggest the use of these names be discontinued and a new name developed and continued over a long period of time so there will be a common understanding by all people regarding its meaning. We fully recognize that political considerations must be taken into account and that each administration and perhaps each session of Congress wants to enact a program that can be tied to that Congress or administration. This continual name changing is confusing to program participants and to the public. We suggest that a name such as "Soil Conservation Assistance Program (SCAP)" be considered. The use of this name would imply that technical assistance is available as well as financial assistance for the installation of conservation practices.

We must emphasize that technical assistance is vital if the program is to succeed. We recognize the technical assistance is funded through another appropriation, however, it should be pointed out that Congress could appropriate millions of dollars for a cost-share program and without adequate technical assistance it would undoubtedly be a failure.

(2) The federal cost-share programs have continually come under fire by various administrations dating back as far as the Truman administration. They have been referred to as the rural congressman's pork barrel, as well as many other adjectives. Perhaps some of this criticism is justified. I can recall a payment I received when I was farming of 13 or 15 dollars for seeding land to a legume for a green manure crop which I plowed under in the fall. When I received the check I wondered what justification there was for paying me to do something that required no huge outlay of funds and was really a management practice that every farmer should be following.

Soil conservationists have objected to many of the eligible practices that have been included in the federal cost-share program. Without naming them we would like to point out they are what we would call production oriented. They are practices which landowners should be doing without cost-share incentives. We firmly believe that only permanent soil conservation practices should be cost-shared.

The construction costs on these practices have risen dramatically in recent years. Whether you are in the soil conservation business or a road builder, the costs of today's labor, fuel prices, as well as machine purchase and maintenance, have risen sharply. These high costs have resulted in increased costs to the landowner when soil conservation practices are constructed. To illustrate this point, for the period from 1973 to 1975 costs for parallel grassback slope terraces with tile outlet in the Iowa cost-share program have increased almost 100 percent in some instances. There has been a 63 percent increase in erosion control structures. Waterways have increased some 30 to 40 percent. These are averages and in some areas of the state they are lower and some areas are higher. This will give you some understanding of the need for cost-sharing on those practices which involve huge outlays of money.

(3) We believe the 2500 dollar limitation per farm is totally inadequate under today's conditions and should be dropped.

(4) We oppose the practice of limiting funds to landowners so that the total county allocation can be distributed to more participants. The philosophy of giving landowners 100 to 200 dollars cost-share assistance is just not in the best interests of conservation and really accomplishes nothing. If we are to enter into a true conservation program, cost-sharing must be provided to enable a landowner to construct practices which will have a significant effect in reducing soil losses from erosion.

(5) We strongly favor a long-term contract concept for cost-sharing and planning for establishment of permanent conservation practices. The success of the Great Plains Program attests to the fact that this type of program is sound. Long-term funding and contractual agreements between the government and landowners to establish conservation practices on the land will have the net result of assuring the landowner that funds will be available and also assuring the government the program will be completed.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), administered by the U.S. Environmental Protection Agency, calls for planning and implementation processes to control water pollution. There is need to coordinate these programs for the most effective use of federal funds and the attainment of public goals for environmental upgrading of the nation's water.

We would urge that timetables for cost-share funding of these long-term agreements or long-term fund commitments coincide with projected national goals for water pollution abatement, and thereby assist farmers and ranchers of this country to complete water quality improvement programs.

(6) We recommend that a conservation agreement be approved by the local soil conservation district as a condition for eligibility for conservation cost-sharing. One of the provisions of the Iowa cost-sharing program states that the landowner must be a cooperator with the local soil conservation district before cost-share assistance will be provided.

(7) We suggest that the Congress explore ways and means of making funds available to state soil and water conservation departments, commissions and boards and local soil conservation districts by using procedures such as revenue-sharing, grants-in-aid, or other suitable processes for federal soil conservation cost-sharing.

Such a program might be administered as follows: The Congress could appropriate funds to the U.S. Department of Agriculture for cost-sharing purposes. USDA with assistance from the Soil Conservation Service would allocate these funds to states on a conservation needs basis and the individual states through state departments of soil conservation could then allocate them to the individual districts on a needs basis.

This pass-through of funds from the federal government to soil conservation districts is a sound approach because it will bring all facets of the soil conservation program into play. The Soil Conservation Service would continue to serve as the technical agency for the planning and layout of practices, as well as certifying them after construction. The soil conservation district would be the local implementation agency and the policy-making body for the allocation of funds to farmers and ranchers. The payout procedure upon completion of a practice could be accomplished through the state department of soil conservation.

(8) In recent years we have witnessed the enlargement of farms due to the sale of land to corporations and individuals who are increasing the size of their farming enterprise and in the process have seen soil conservation practices destroyed by the new owners. Many of these practices were cost-shared with federal funds and this has been noted by several members of the Iowa General Assembly as well as other interested individuals.

Apparently, the reason these practices were destroyed is due to the fact that the new owners are farming several hundred acres with large equipment. They have said their equipment cannot be used effectively on terrace systems and other conservation practices. However, after the practices were removed these individuals have farmed up and down the slopes, which is a very effective method of accelerating soil losses from erosion. In several instances no attempt has been made to farm across the slopes.

The members of the Iowa General Assembly in noting this trend have taken steps in the Iowa cost-share appropriation to prohibit this practice. Since the Iowa program began in 1973, there has not been a practice destroyed on which state cost-share funds were used. However, the General Assembly through language in the 1976-77 appropriation bill, which provided the 4 million dollars for cost-sharing, has stated very strongly that language shall be written into the cost-share agreement entered into by the landowner and the soil conservation district that if the landowner destroys or alters the conservation practice without the consent of the State Soil Conservation Committee, all of the state cost-share funds must be repaid to the Department of Soil Conservation. The time period for the repayment feature of the agreement is 10 years.

We believe the same type of language should be used when landowners sign an agreement for federal cost-share funds. It goes without saying that the public does not look favorably upon these practices being destroyed or altered when public funds are used for their construction.

We have listed in this statement the most important items which we believe are needed to strengthen the federal cost-sharing program. There are other practices for which federal funds could be used for cost-sharing and many of these practices are currently being cost-shared. We do not object to cost-sharing practices that are not basically erosion control; however, we believe if such items as drainage systems, animal waste pollution abatement practices, recreation and wildlife practices, stream bank and lake shore protection, etc., are to be cost-shared with federal funds, then it should be accomplished under another program. We do not want to give the impression that we feel these practices are not necessary for an improved environment. We believe they are good practices but should be financed under a separate program with a different name.

Finally, we hope that if a new cost-share program is adopted or if the present program is continued, that all members of Congress—both rural and urban—Republican and Democrat—will lend support because if agriculture is to meet its commitments in improving the environment, adequate financing incentives and long-term commitments are needed.

I again want to thank you for giving us the opportunity to present our thoughts on the federal cost-sharing program.

STATEMENT OF GEORGE K. ANNAN, CHAIRMAN, PAGE COUNTY SOIL CONSERVATION DISTRICT, AND MEMBER, IOWA STATE SOIL CONSERVATION COMMITTEE, CLARINDA, IOWA

I am concerned with making a sound soil and water conservation program available to local people in agriculture. My comments come as a result of spending my entire life making a living from the land. At the same time I have served 23 years as a district commissioner for the Page County Soil Conservation District and am serving my tenth year as a member of the State Soil Conservation Committee.

We have a demanding need for an effective and efficiently administered conservation program that will insure the availability of cost-sharing funding for the establishment of long term permanent conservation practices.

I say we have a demanding need for an effective conservation program because we have people in this country demanding that our environment be protected. Our government is practically demanding all out grain production for various reasons which we won't go into here. Less than ten years ago, we, as farmers were asked to produce less grain and set aside feed grain acreage. Now we are

being asked to plow up everything. In short, our national policies relating to agriculture have been incredibly short sighted and patterned to serve the political needs of the time. This type of agricultural policy can only lead to disaster. Past history in the Bible tells of the land of milk and honey that was not taken care of and is now a desert.

Why do I say this? Page County, for example, is a highly productive agricultural county. However, 62 percent of the land in Page County must be protected with some type of conservation practice if it is to continue to be productive.

If we continue with all out production of row crops on this 62 percent of our soil area, we will be losing two bushels of soil for every bushel of grain produced. With this amount of erosion, in fewer years than you and I like to think about, 62 percent of our land area in Page County would not be fit for cultivation. Less than 10 percent of our soils in Page County can be intensively farmed year after year to row crops and not be damaged from excessive erosion. No doubt technology will continue to improve the yields of our crops but not enough to replace 62 percent of our productive areas. We are taking thousands of acres out of production for roads, urban construction, airports and etc.

I say we need an effective conservation program because we know the world population is going to continue and this 62 percent or less of our county's soil area is going to have to be farmed intensively to meet the total needs that are being asked of it. Our only hope is to treat it and get it done quickly.

Cost-share programs are essential to assist private landowners and motivate them to take necessary action in the area of permanent soil and water conservation measures. I have mentioned the term "permanent soil and water conservation measures," and feel there is a distinction that needs to be made that does not exist at the present time. I term permanent conservation practices as the construction of terraces, erosion control dams, grass waterways and, in general, construction type measures that require a significant capital expenditure. In Iowa, I feel the cost-share monies appropriated by the state legislature are directed toward permanent soil and water conservation efforts and are not used for temporary or normal farming practice procedures. In the area of federal cost-share programs, I feel a great deal of the money is lost in providing cost-sharing for practices that would have been carried out in the normal farming operations such as the short term seedings at the sacrifice of having more money available for the more costly permanent type conservation practices that are badly needed.

In checking with six counties, I find that ASCS cost sharing is not adequate or being used for permanent conservation practices. The usage of the county allocation for permanent type practices or those practices that were referred to the Soil Conservation Service for technical assistance and are in support of the local soil conservation district program varied widely in different counties. Flexibility of programs is good but during the past two years from 20 percent up to 95 percent of the allocation was used for permanent practices. Some of the areas that have received the highest dollar allocation of federal cost-share monies have utilized the least amount for permanent practices. In general, those that I checked in total, show only 50 percent of the total money used for permanent practices. I feel those counties who have directed 90 to 95 percent of the cost-share monies toward permanent conservation practices show evidence on the land and more support from local people for the conservation program as compared to locations which have tended to spread the monies around for less effective conservation purposes. Generally, I find good or excellent support for conservation practices and cost-sharing for them if we can show the evidence that it is used for more permanent conservation on the land. I feel that future legislation should direct the monies be used for practices that will be utilized and maintained for a minimum of ten year period and stronger emphasis placed on the utilization of the monies for use on permanent type practices. To do this, it may be well to direct the monies to the states and utilize the existing state soil conservation agencies to administer these funds and also provide an additional incentive to the states by providing additional monies to match state funding of similar programs.

The conservation program we need is going to have to be efficient because it seems we have been limited on the number of technical people required to get the job done. Taxpayers and voters are tired of seeing new agencies and bureaus created just to give someone a job with little actually being accomplished. The program I am talking about will be no exception. It looks like we're going to have to put something into effect that can be run by the people

already trained and available with only minimal increases in number of personnel. If we're going to insure the availability of cost-share funds, we are going to have to think like the Pentagon in terms of dollars.

We have seen the Public Law 566 Watershed Act become into effect and at the same time it was inaugurated we promised the local farmers that considerable amounts would be used for small flood control structures in return for terracing and conservation measures and right-of-ways. The program was slow in acceptance, but now the farmers see the need and want to cooperate and build the watersheds in their areas but federal has cut the personnel and funding that made this possible. This has made it difficult to keep the interest of the local people. Prices used in benefits has not been adjusted in relation to construction costs, therefore, many watershed structures and projects have been determined non-feasible. This program is practically nonexistent under the rulings we have today. If we are going to have a successful watershed program we must have action now!

The landowner and the government have an obligation to see that our soil stays in a productive state. The time to develop effective legislation to insure our continued agricultural capability is overdue. Iowa has made a commendable start. Let's see that we get the type of leadership necessary to follow suit on the national level.

NOTE: Informal contact with Decatur, Ringgold, Taylor, Page and Fremont Soil Conservation Districts show the approximate usage of ACP moneys: Decatur 20 percent of \$89,000 allocation has been allocated in support of the district program by 247 referrals to the Soil Conservation Service, Ringgold approximately 33 percent of a \$91,000 allocation, in Taylor approximately 60 percent of a \$81,000 allocation, in Page 90 percent of a \$57,000 allocation and in Fremont approximately 95 percent of \$57,000 allocation.

STATEMENT OF GEORGE R. HALLBERG, CHIEF, RESEARCH DIVISION, IOWA GEOLOGICAL SURVEY, STATE OF IOWA, IOWA CITY, IOWA

The issues of soil and water conservation are indeed of vital concern to Iowa and the nation. It is good to see concern with this issue at your level of national government.

In many respects these are a single issue. One of the most difficult problems of water quality is the control of non-point source pollutants and sediments resulting from soil erosion and agricultural runoff.

To combat these problems Iowa has enacted a very progressive Soil Conservation Act, implemented by the Iowa Department of Soil Conservation. However, shortly after enactment of this law there was a pronounced shift in national agricultural policy. This national policy; to place all available land into full production, was coupled with spending cutbacks or the termination of certain national soil conservation programs. Coupled with other economic pressures this effectively forced considerable acres of land that had been used for haycrops and pastureland to be converted to row crop production. Much of this was land which was prone to severe soil erosion. This has taken place so rapidly that there has not been time available, nor money, to adequately protect this land.

Recent uncertainties of federal funds that will be available has made planning for the implementation of soil conservation measures difficult, also. For more effective utilization of funds and implementation of conservation plans, more certainty in funding is also a necessity.

The present limits placed on certain federal cost-sharing programs should be raised to realistic levels. These programs should also be redirected to insure funding for the establishment of long-term, permanent conservation practices. (The cost-sharing program instituted by the State of Iowa has stipulated that only permanent soil conservation practices can be cost-shared.)

The crux of this issue is that national agricultural policy for maximum production and the issue of soil conservation must be brought together as concurrent goals. We cannot afford maximum short-term production at the expense of our long-term productivity and the loss of our most valuable natural resource—soil—and the deterioration of water quality. With the great inflation in land prices and the increasing economic pressures on our agricultural society this will have to be accomplished by providing economic incentives, using, improving, and expanding cost-sharing programs, providing tax incentives, and other measures.

Soil conservation benefits all the people of this country, and it must become a national priority again. Soil conservation efforts from the national level must be increased not decreased, as the recent trend has been, if our long-term productivity and quality of life is to be maintained.

STATEMENT OF KENNETH M. RASCH, EXECUTIVE SECRETARY, IOWA LAND IMPROVEMENT CONTRACTORS ASSOCIATION, FORT DODGE, IOWA

We were set to attend the June 11 hearings at Sioux City, however previous commitments made it impossible to be on hand for July 6.

The following testimony is offered to be included in the record of the July 6 hearing at Sioux City (on the Leo Ryan farm).

While flying in April and May of this year and simply looking out of the airplane window, it became obvious that we would be headed for major erosion problems. As far as you could see, the land was predominately black and in various stages of row crop. This condition sets the stage for all types of erosion, which in some areas developed into disaster proportions. Strong winds caused the loose topsoil to drift into ditches and adjoining fields where it covered tile intakes. In some cases, drifts up to four feet were measured. Then the rains came, some gentle, but as always the gully washers carrying our priceless topsoil into the rivers and streams to further degrade our water qualities.

High concentrations of chemicals seem to keep the topsoil in a loosened condition which makes it especially susceptible to erosion. In our quest for more production, we have almost completely abandoned a rotation plan that used to include oats, grass and hay.

Visual observations prove that row crops on sloping ground invites heavy soil losses. Farming on the contour helps to alleviate some of this problem, but terraces are the real answer. The construction of which is limited to the short while of time, that is after the frost is out and before planting. A wet spring is sure disaster to a contractor who is attempting to build miles of terraces in about a four week period. Often it is so wet that the farmer cannot even get into the field himself to prepare the seed bed, and yet he expects the contractor to get the work done.

We must develop the idea of a "Green Belt". That area where oats, grass or hay can be planted, to set up a work area, for conservation practices to be constructed upon. Maybe along the line of diverted acres. The end result would be to put out of production, land that is too steep for row crop without the protection of conservation measures. Farmers and contractors could then set up long term planning that would allow orderly progress in construction. It would also make it possible for contractors to plan the purchase of new equipment based on a longer working season. (He could work in the Green Belt while the crops were growing.)

We need a Green Belt for other reasons too. We need to cut down on the size of the very large fields like you see in Kansas and Washington, where there will be a mile strip in row crop, separated by strips of green (oats, wheat, barley, hay, etc.). This helps to cut down on wind erosion and the dust storms.

More and more trees are being bulldozed out of old fence rows. This allows the wind to have a clean sweep of the areas. Also old farmsteads are being eliminated entirely (all trees and buildings) at an alarming rate.

Finally, consider the idea of the "Green Belt" to bring back sensible rotation plans, directed at saving our soil from wind and water and providing a working area for construction of permanent conservation measures.

STATEMENT OF R. G. SPOMER, AGRICULTURAL ENGINEER

Research was initiated in 1964 by the Agricultural Research Service on five watersheds in the loess soil area near Treynor, Iowa. The objectives are to study the effects of conservation and agronomic practices on hydrology (water movement over and in the soil), sheet erosion, and gully erosion.

The research watersheds vary in size from 75 to 389 acres. Watershed descriptions are given in figure 1 of the handout. Briefly, four watersheds are located near Treynor; two adjacent watersheds occur in two pairs three miles apart, while the fifth watershed is 10 miles to the east. One pair of watersheds has been

continuously cropped to corn and contour farmed. One watershed was in grass from 1964 through 1971. Starting in 1972, this watershed has been corn cropped using a conservation tillage system. The fourth watershed was level terraced and continuously corn cropped from 1964 through 1971. A new parallel storage-fill terrace system was installed in 1972 with terrace intervals about double those normally specified. Underground type drains were installed in these terraces, and a conservation tillage system was implemented for continuous corn cropping. The fifth watershed near Macedonia was level terraced by 1964 and has been privately managed by the land owners resulting in mixed cropping of the area.

Fertilizer application rates are given in figure 1 of the handout and are important to the study of chemical movement from agricultural areas. The high rate of 400 pounds per acre of nitrogen and 87 pounds per acre phosphorus was applied on two watersheds to evaluate the effect of excessive fertilization on nitrogen and phosphorus movement.

Table 1 includes the hydrologic and erosion data for 1964-1971 from continuous corn-cropped, contour-farmed watersheds and shows average annual sheet erosion of 22 to 26 tons per acre. Gully erosion from these watersheds averaged 400 to 500 tons per acre. During this period, the average surface runoff from these contour-farmed, continuous corn watersheds was 3 times the surface runoff from the grass watershed and 6.5 times the surface runoff from the terraced corn-cropped watersheds.

Since 1972 few runoff-producing storms have occurred. Consequently, runoff and erosion values have been low for all watersheds.

For three years (1969-1971) plant nutrient losses were intensively monitored; the average annual runoff loss of nitrogen and phosphorus from the terraced watershed was one-tenth and one-ninth, respectively, of the loss from the contour watersheds. Ninety-two percent of the nitrogen and eighty-five percent of the phosphorus losses from the contour-farmed watersheds were associated with the sediment.

The five-year (1969-1973) average annual nitrogen and phosphorus discharges are shown in figures 10 and 11 in the handout. The nitrogen discharged from the contour-farmed watersheds was 27 and 19 pounds per acre while only 8 pounds per acre of nitrogen left the terraced watershed.

Continued research at these watersheds will yield needed information on water, soil, and chemical movement for various conservation tillage systems. Additional data are needed to verify and improve computer models so that we can predict water runoff, soil erosion (sheet and gully), and chemical movement on other watersheds. Also, information is being collected to refine, improve, and extend the applicability of the Universal Soil Loss Equation to field-size and larger watersheds.

Studies underway at Treynor and on the Tarkio drainageways are yielding new insights to causes of gully erosion, and eventually we hope to devise new approaches to stabilize drainage channels in the loess area.

Flexibility in conservation treatments must be achieved insofar as soil types and soil classes will permit. Practices must be designed to be compatible with present and future multiple-row farm equipment.

TREYNOR WATERSHEDS

Research was initiated in 1964 by Agricultural Research Service on five loess-soil watershed near Treynor, Iowa. The objectives were to study the effects of several conservation and cultural practices on hydrology, gully erosion, and sheet erosion. A nutrient study was begun in 1969. Land use and tillage practices were unchanged during the 1964-1971 period. In 1972, the grass watershed (figure 4) was converted to continuous corn planted with minimum tillage. The level-terraced watershed was reshaped using fewer terraces (figure 5), pipe outlets, and minimum tillage. A description of these watersheds is given in figure 1; figures 2 through 6 provide information on topography and instrumentation of the watersheds, and figure 7 presents a typical geologic section of the study watersheds.

Annual values of water and sediment yield are given in table 1. As shown in figure 8, the average annual water yield has been about the same from the terraced and unterraced watersheds in corn, but the proportions of surface and base flow have been considerably different. Most of the water that leaves the unterraced watersheds is surface runoff, but most of that which leaves the terraced watershed is base flow (ground water discharge).

Figure 9 shows that the average annual sheet-rill erosion has been about 24 tons per acre per year from the unterraced-corn watersheds but less than 1 ton per acre per year from the level-terraced and grass watersheds. Significant amounts of gully erosion have occurred on watersheds 1 and 2 but very minor amounts from grass and level-terraced watersheds 3 and 4, respectively.

The nutrient study included the movement of nitrogen and phosphorus in surface runoff, deep percolation, and base flow. Conservation practices and two levels of fertilizer application are the variables being considered. Figure 1 gives conservation practices and fertilizer application rates.

Level terraces (1964-1971) effectively reduced runoff, erosion, and nitrogen and Phosphorus discharged in surface runoff. Surface runoff from two contour-farmed watersheds was 7 and 8 times greater and sediment loss was 12 and 19 times greater than from a level-terraced watershed. The average annual loss of nitrogen and phosphorus in the surface runoff from the terraced watershed was one-tenth and one-ninth, respectively, as great as the loss of nitrogen and phosphorus from the contour-farmed watersheds. Ninety-two percent of the nitrogen and eighty-five percent of the phosphorus from the contour-farmed watersheds were associated with the sediment.

Figures 10 and 11 show the 5 year (1969-1973) average discharge of nitrogen and phosphorus in surface runoff. The nitrogen discharge from watersheds 1 and 2 was 26.8 and 19.2 pounds per acre, respectively. Of this amount, 24.6 and 18.0 pounds per acre of nitrogen were transported by the sediment. From 1969 to 1971, only 2.7 pounds per acre of nitrogen left level-terraced watershed 4 each year, and 2.3 pounds per acre of this was associated with the sediment. A marked increase of nitrogen occurred in surface runoff from watershed 4 after the 1971 treatment change, and the 5-year average annual N in surface water was 8.2 pounds per acre.

Nitrogen runoff in base flow for the 5-year period averaged 16.5, 5.1, 9.1, and 24.8 pounds per acre per year, respectively, for watersheds 1 to 4. The high rate for level-terraced watershed 4 is attributable to the generally high base flow levels, the high rate of nitrogen application, and the 57.2-pound-per-acre loss in 1973—when rainfall was 12 inches above normal.

TABLE 1.—SEDIMENT YIELD ACCORDING TO EROSION SOURCE FROM TREYNOR, IOWA WATERSHEDS, 1964-74

Year and watershed number	Annual precipitation (inches)	Base (inches)	Runoff surface (inches)	Total (inches)	Sheet-rill T/A	Gully (tons)	Total T/A
1964:							
1-----	35.61	1.92	4.56	6.48	125.0	1670	34.0
2-----	35.16	2.16	4.02	6.18	125.0	1331	29.0
3-----	33.49	2.36	.42	2.78	.3	64	2.9
4-----	34.80	5.67	.79	6.46	.7	10	2.8
1965:							
1-----	45.35	3.57	10.63	14.20	44.0	1,162	59.6
2-----	44.35	2.97	10.69	13.66	36.4	660	44.4
3-----	44.28	4.61	4.59	9.20	1.4	186	1.2
4-----	44.87	10.57	2.51	13.08	1.9	116	1.0
1966:							
1-----	20.32	2.55	.64	3.19	6.7	93	7.9
2-----	20.53	2.40	.86	3.26	8.6	177	10.7
3-----	22.01	2.54	.37	2.91	1.1	110	.2
4-----	21.88	5.93	.16	6.09	.6	14	.7
1967:							
1-----	38.25	2.27	11.56	13.83	99.1	1,455	118.5
2-----	37.61	2.50	10.46	12.96	75.2	1,374	91.6
3-----	34.23	3.30	2.65	5.95	.6	120	1.7
4-----	34.55	7.28	.72	8.00	2.9	a-23	2.7
1968:							
1-----	32.30	1.67	1.14	2.81	3.7	102	5.1
2-----	32.50	1.81	1.13	2.94	4.1	44	4.6
3-----	31.10	1.59	1.01	2.60	.2	13	.3
4-----	32.18	4.22	.13	4.35	.3	2	.3
1969:							
1-----	31.42	3.17	2.52	5.69	1.8	118	3.4
2-----	31.54	2.98	2.33	5.31	1.0	55	1.7
3-----	30.64	3.29	1.73	5.02	.1	19	.3
4-----	30.70	6.10	.27	6.37	.1	-5	.1
1970:							
1-----	31.51	2.21	2.14	4.35	11.8	177	14.0
2-----	30.82	2.36	1.79	4.15	7.4	171	9.5
3-----	28.85	2.18	.37	2.55	<.1	5	.1
4-----	28.79	3.99	.13	4.12	.1	<1	.1

See footnotes at end of table.

TABLE 1.—SEDIMENT YIELD ACCORDING TO EROSION SOURCE FROM TREYNOR, IOWA WATERSHEDS, 1964-74—Con.

Year and watershed number	Annual precipitation (inches)	Base (inches)	Runoff surface (inches)	Total (inches)	Sheet-rill T/A	Gully (tons)	Total T/A
1971:							
1-----	29.06	2.06	4.93	6.99	20.0	399	25.4
2-----	29.17	2.62	3.83	6.45	13.3	241	16.2
3-----	29.82	2.85	1.51	4.36	1.4	130	.6
4-----	30.08	5.52	.68	6.20	1.5	16	1.6
1972:							
1-----	33.94	2.69	1.51	4.20	7.5	362	12.4
2-----	34.04	3.01	1.52	4.53	7.9	120	9.3
3-----	37.49	6.23	.82	7.05	1.2	-32	.9
4-----	37.50	5.75	4.22	9.97	6.5	48	6.8
1973:							
1-----	41.71	8.19	2.61	10.80	1.0	100	2.4
2-----	41.18	10.06	2.95	13.01	.5	67	1.3
3-----	40.63	14.58	1.08	15.66	.1	-1	.1
4-----	40.31	12.01	3.34	15.35	1.0	50	1.4
1974:							
1-----	24.82	6.47	.52	6.99	.5	31	.9
2-----	24.47	8.58	.58	9.16	.3	37	.8
3-----	22.05	8.16	.07	8.23	< .1	< .1	< .1
4-----	21.18	7.44	.25	7.69	< .1	5	.1
Averages, 1964-74:							
1-----	33.12	3.34	3.89	7.23	20.1	424	25.8
2-----	32.85	3.77	3.65	7.42	16.3	298	19.9
3-----	32.24	4.70	1.33	6.03	.3	29	.6
4-----	32.44	6.77	1.20	7.97	1.3	11	1.4

¹ Division between sheet-rill and gully erosion—estimated.

² Total and component erosion values—estimated.

³ Negative value indicates channel fill.

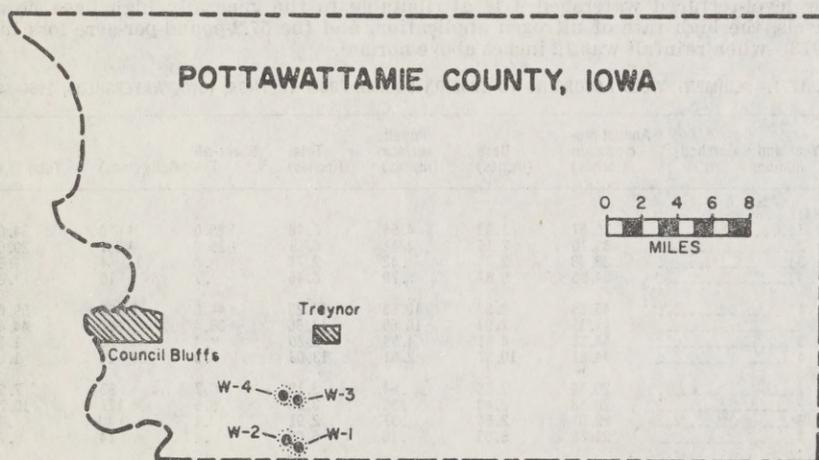


FIGURE 1.—Location and description of research watersheds.

WATERSHED DESCRIPTION

Watershed No.	Size (acres)	Cropping	Land treatment
1.....	74.5.....	Continuous corn.....	Approximately contoured.
2.....	82.8.....	do.....	Do.
3.....	107.0.....	Grass ¹	None. ²
4.....	150.0.....	Continuous corn.....	Level-terraced. ³
5.....	389.0.....	Mixed cropping.....	Do.

	Fertilizer applications, pounds per acre								
	1964-68 average			1969 to 1970			1971 to present		
	N	P	K	N	P	K	N	P	K
1.....	135	28	13	400	4 87	25	6 400	35	25
2.....	132	30	13	150	35	25	150	35	25
3.....	84	18	0	150	35	25	150	35	25
4.....	107	35	14	400	4 87	25	7 400	35	25
5.....	(⁸)	(⁸)	(⁸)	(⁸)	(⁸)	(⁸)	(⁸)	(⁸)	(⁸)

¹ Planted to continuous corn with minimum tillage in 1972.

² Approximately contoured, 1972-75.

³ New terraces and minimum tillage began in 1972.

⁴ Reduced to 35 in 1971.

⁵ Reduced to 100 on all watersheds in 1975 because of 1974 drought.

⁶ 1968 only.

⁷ Reduced to 150 in 1972.

⁸ 8 farms; inadequate information.

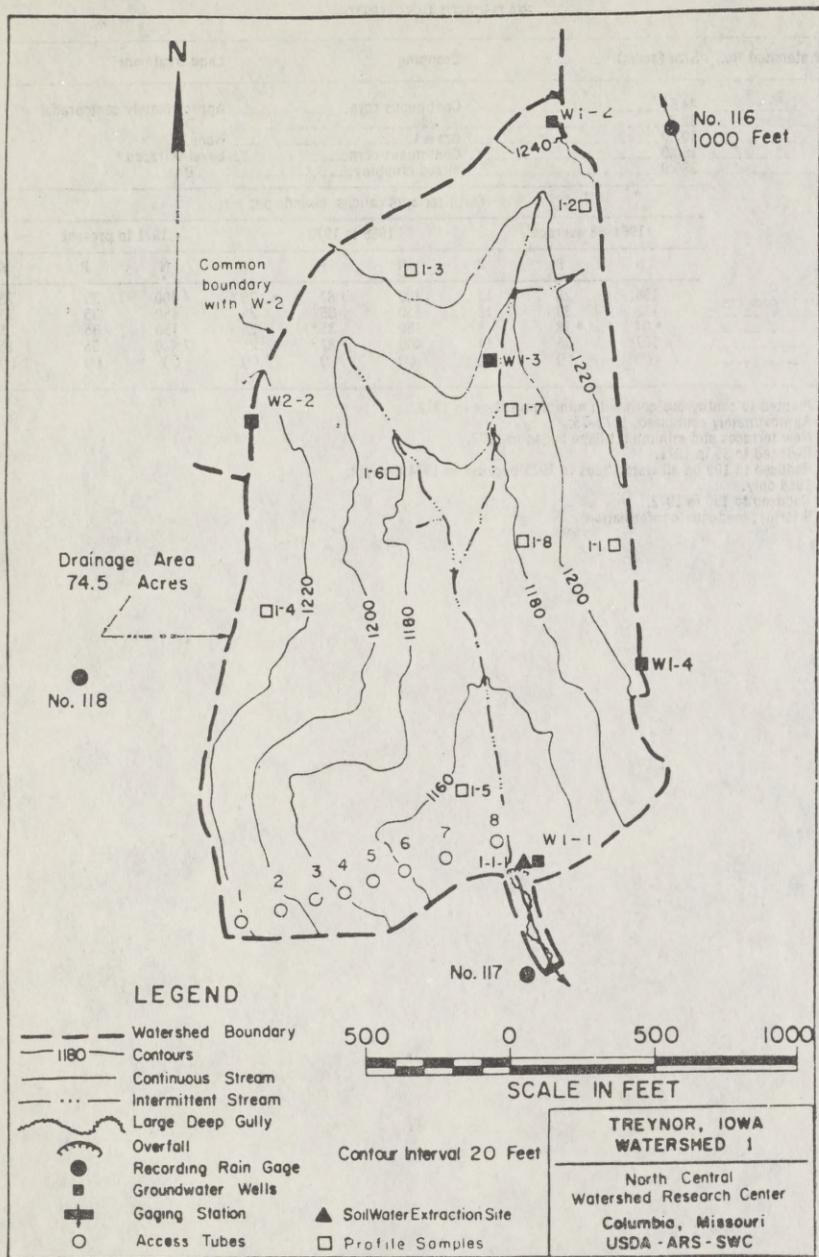


FIGURE 2.—Instrumentation on watershed 1.

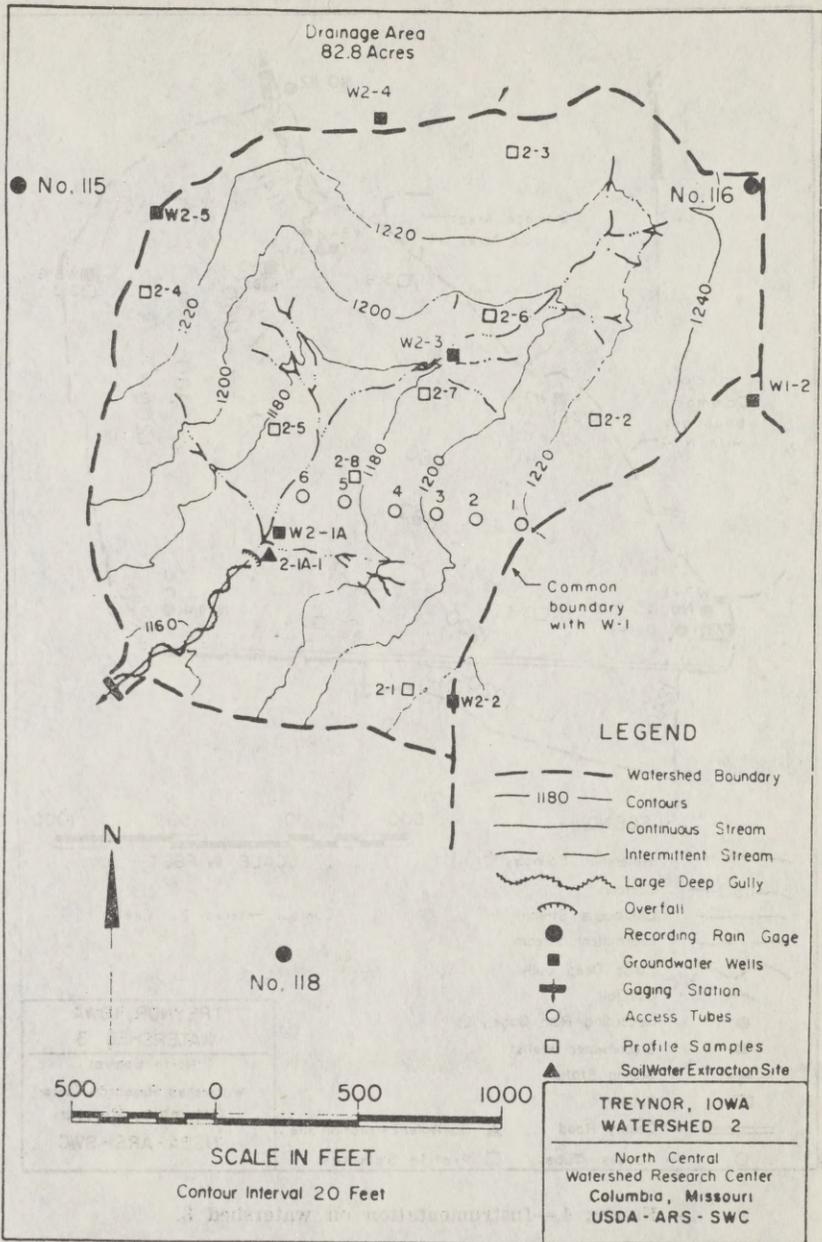


FIGURE 3.—Instrumentation on watershed 2.

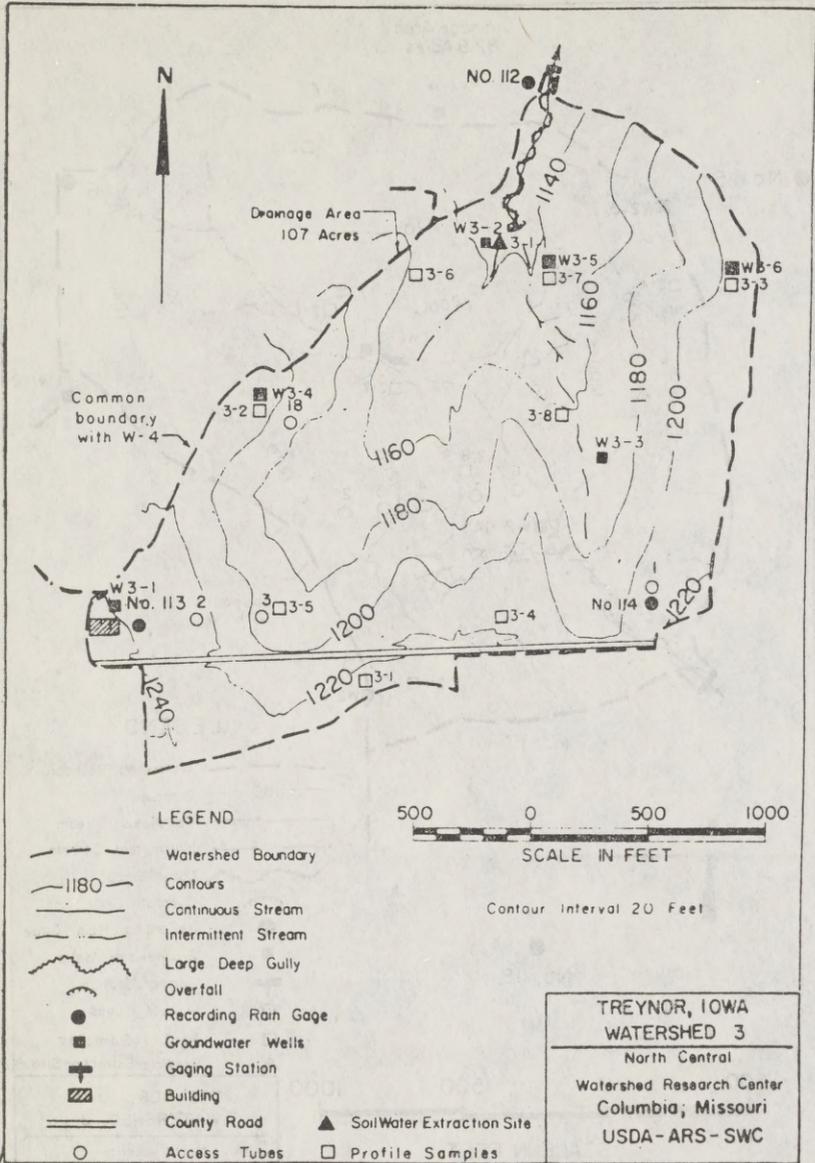


FIGURE 4.—Instrumentation on watershed 3.

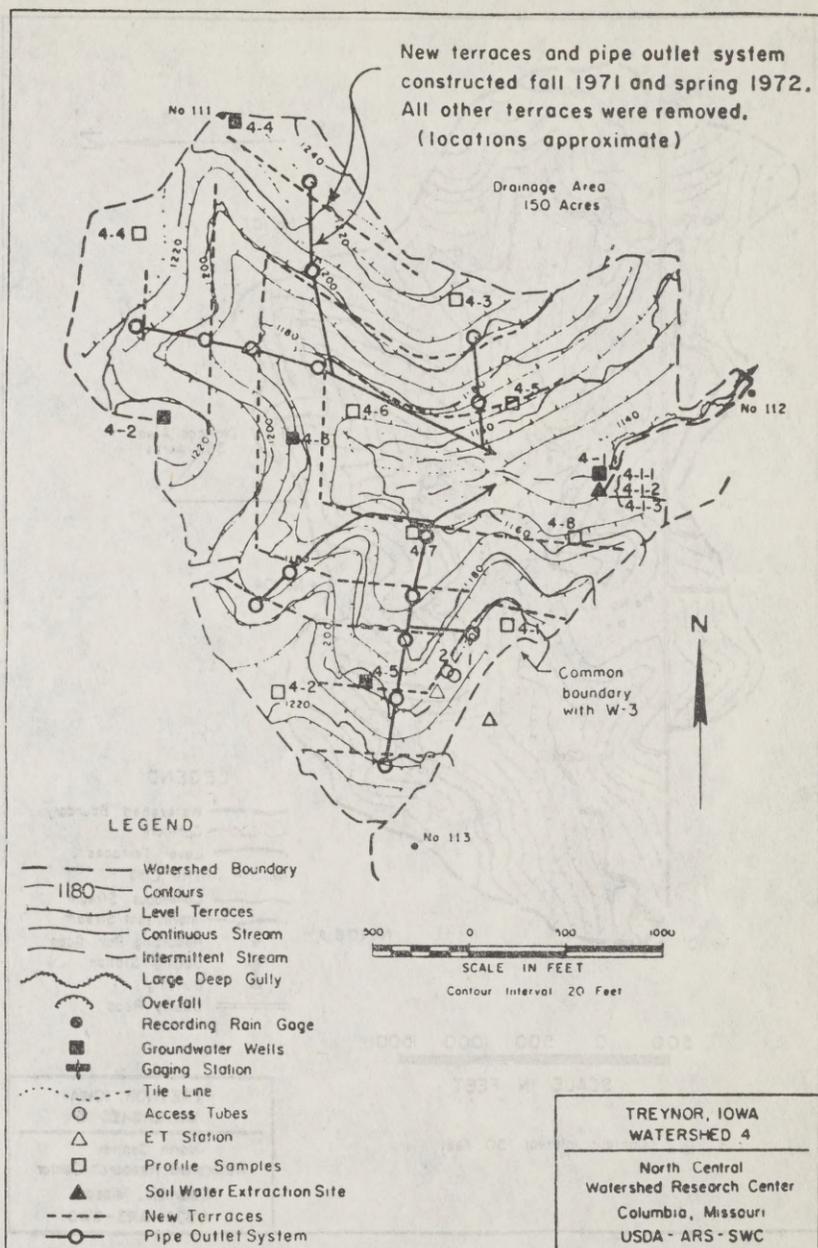


FIGURE 5.—Map of Watershed 4 in Pottawattamie County, near Treynor, Iowa.

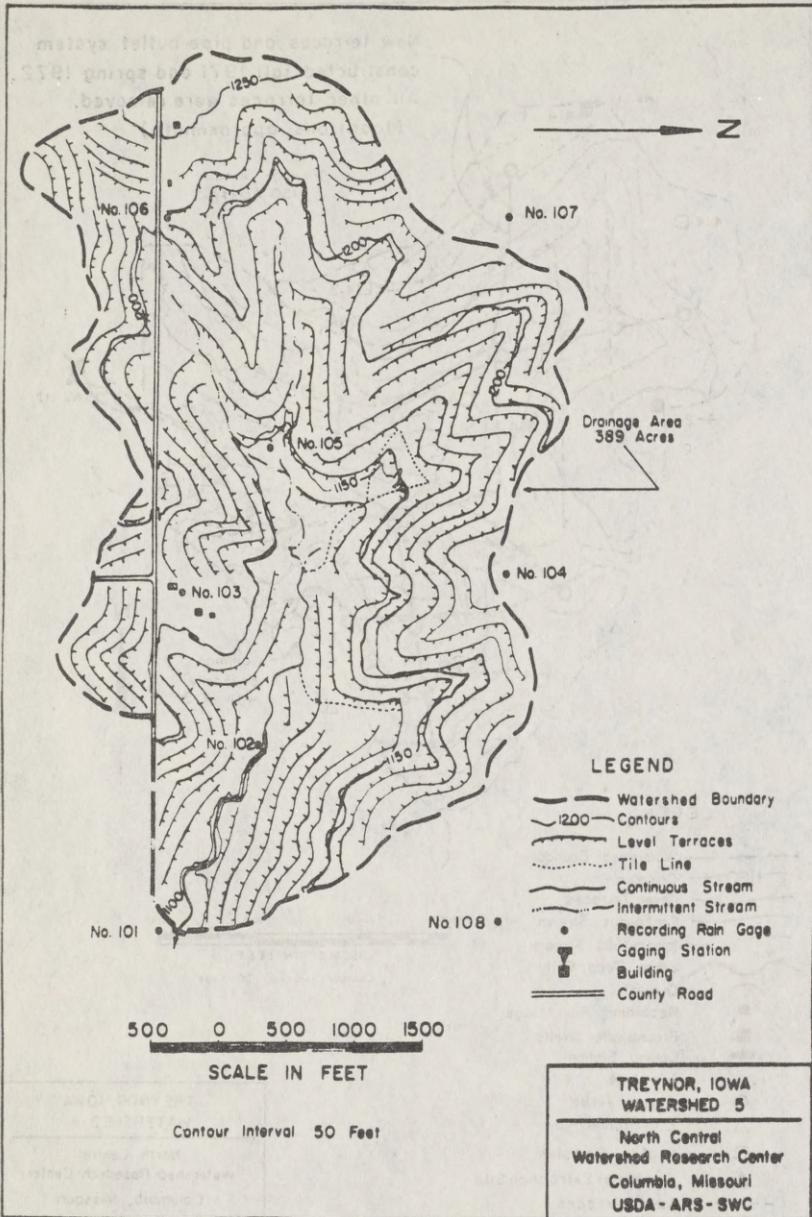


FIGURE 6.—Instrumentation on watershed 5.

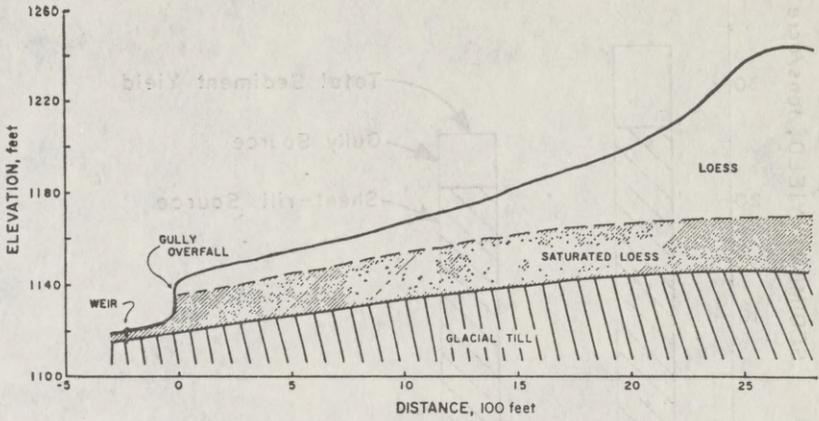


FIGURE 7.—Geologic section of loessial watersheds.

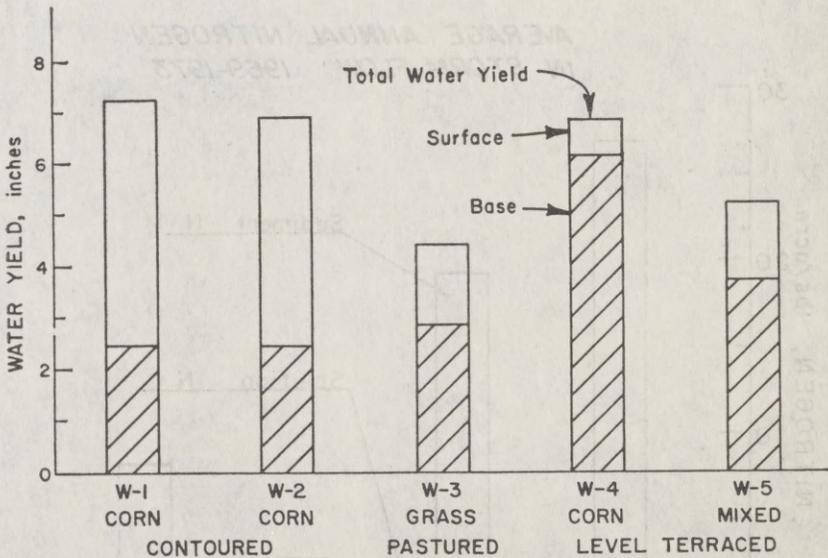


FIGURE 8.—Land use and conservation treatment effects on the average annual water yield of the Treynor, Iowa watersheds, 1964-1971.

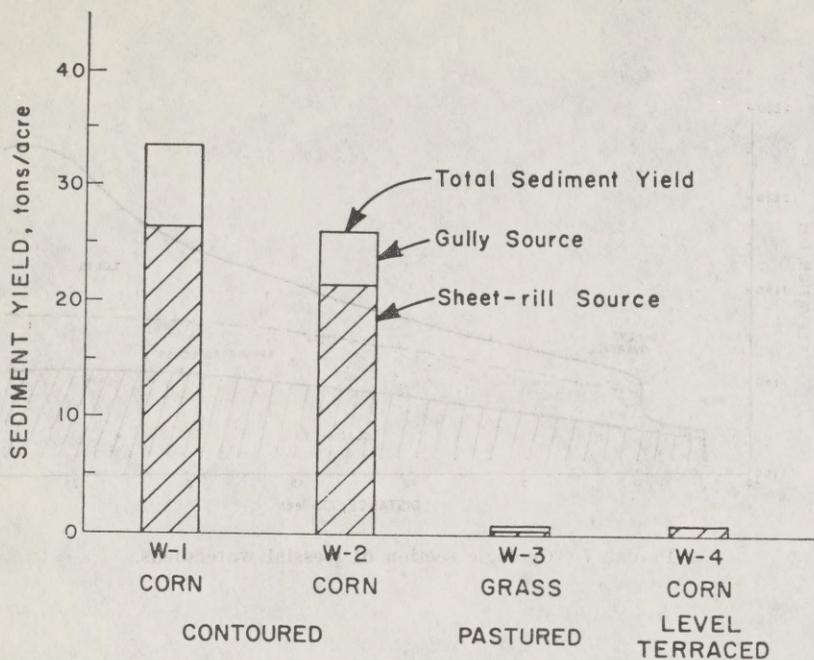


FIGURE 9.—Land use and conservation treatment effects on the average sediment yield of the Treynor, Iowa watersheds, 1964-1971.

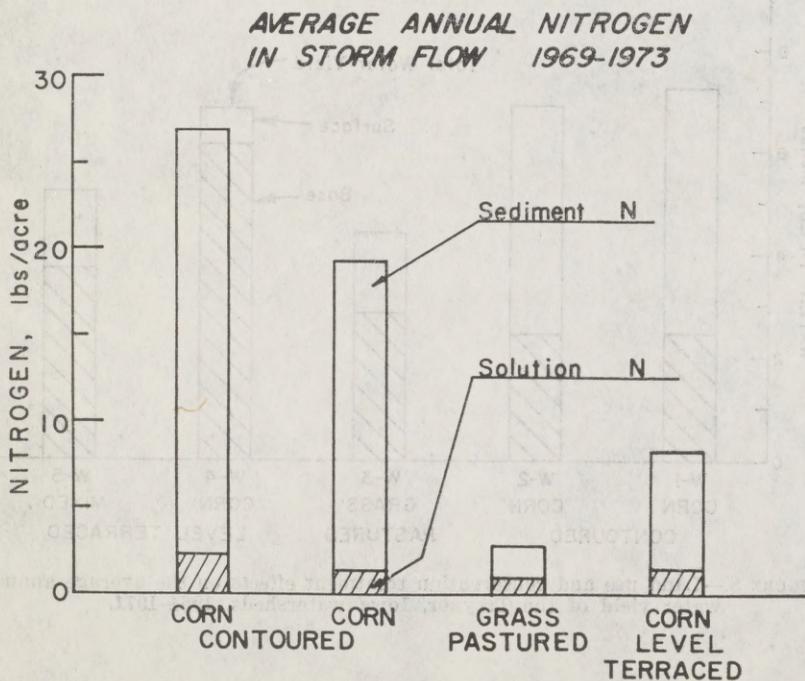


FIGURE 10.—Average watershed discharge of nitrogen in surface runoff, 1969-1973.

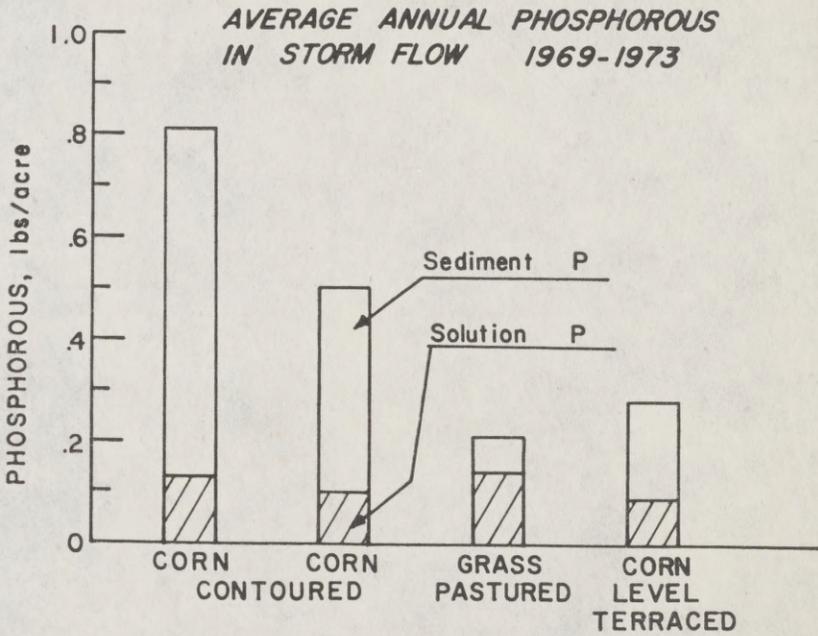


FIGURE 11.—Average watershed discharge of phosphorus in surface runoff, 1969-1973.



AVERAGE ANNUAL PHOSPHORUS
IN STORM FLOW 1962-1973

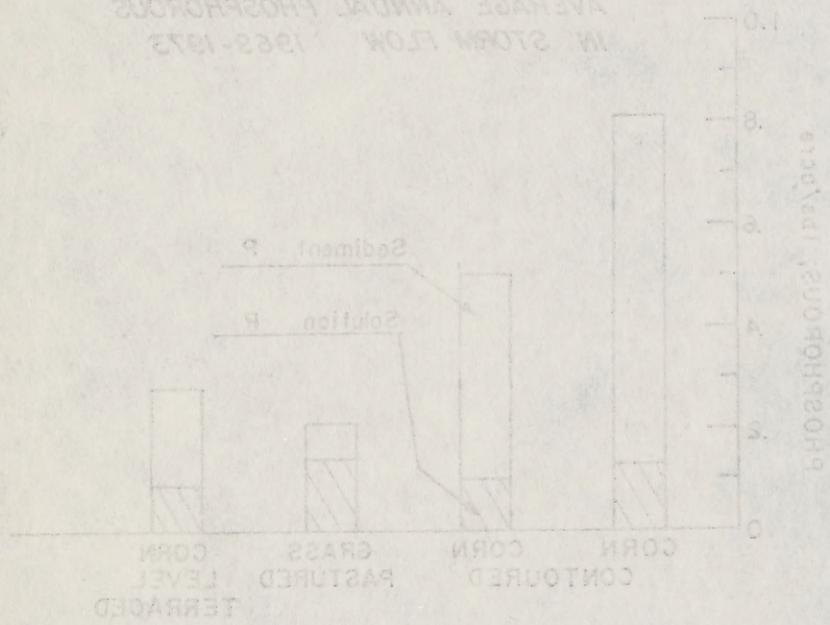


FIGURE 11—Average weighted discharge of phosphorus in surface runoff, 1962-1973.

