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AGRICULTURE BIOTECHNOLOGY: A LOOK AT FEDERAL REGULATION AND STAKEHOLDER PERSPECTIVES

HEARING

BEFORE THE

COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

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CONTENTS

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Wednesday, October 21, 2015

UNITED STATES SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC

The committee met, pursuant to notice, at 10:04 a.m., in room 106, Dirksen Senate Office Building, Hon. Pat Roberts, Chairman of the committee, presiding.

Present or submitting a statement: Senators Roberts, Boozman, Hoeven, Perdue, Ernst, Tillis, Sasse, Grassley, Thune, Stabenow, Leahy, Brown, Klobuchar, Bennet, Gillibrand, Donnelly, Heitkamp, and Casey.

STATEMENT OF HON. PAT ROBERTS, U.S. SENATOR FROM THE STATE OF KANSAS, CHAIRMAN, U.S. COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

Chairman ROBERTS. Good morning. I call this meeting of the Senate Committee on Agriculture, Nutrition, and Forestry to order.

I have said many times that one of our committee's main goals is to conduct thorough oversight of issues within our jurisdiction. We have a responsibility to ensure that government agencies carry out laws passed by Congress in an efficient and effective manner.

Today's hearing is an important step in the committee's work as we hear from the three agencies tasked with regulating agriculture biotechnology: USDA's Animal and Plant Health Inspection Service, the Environmental Protection Agency, and the Food and Drug Administration. We will also hear from witnesses that represent different perspectives in the value chain of agriculture and food production: A farmer, a food manufacturer, as well as representatives of other consumer opinions and a medical professional.

We have all heard about our growing global population, currently at seven billion and estimated to reach over 9.6 billion in the next several decades. We have seen too many examples in recent years where shortfalls in grain and other food items or increases in prices at the consumer level have helped to trigger outbreaks of civil unrest and protest in places like the Middle East and Africa.

In light of these global security threats, today's farmers are being asked to produce more safe and affordable food to meet the demands at home and around the globe. At the same time, they are facing increased challenges to production, including limited land and water resources, uncertain weather, and pest and disease

issues. Over the past 20 years, agriculture biotechnology has become a valuable tool in ensuring the success of the American farmer in meeting the challenge of increasing yield in a more effective, safe, and responsible manner.

So, as we review these issues, we must continue to be guided by the best available science, research, and innovation. Today, I look forward to our government witnesses highlighting the steps their agencies have taken to ensure that agriculture biotechnology is safe—safe to other plants, safe to the environment, and safe to the food supply. We do have a regulatory system that makes biotechnology crops among the most tested in the history of agriculture.

The multi-agency approach referred to as the Coordinated Framework for the Regulation of Biotechnology was established with a science and risk-based approach back in the 1990s, and the White House Office of Science and Technology Policy has recently initiated a process to review the regulatory system. Now, their objective is a long-term strategy to ensure that the federal regulatory system can assess any risks associated with products of biotechnology while supporting innovation and protecting health and the environment, maintaining public confidence in the regulatory process, increasing transparency and predictability, and reducing unnecessary costs and burdens. That is a mouthful. That is quite a mission statement.

Today, we will also hear from representatives of the value chain of agriculture and food production. This includes witnesses with firsthand experience farming and in food production and it includes perspectives of those that deal with hunger and health issues on a daily basis.

Increasingly, many Americans have taken an interest in where their food comes from and how it is made. Throughout this discussion, I hope we remember the importance of focusing on science and consider our role to help ensure a safe, affordable food supply for consumers at home and all around the globe.

I thank each witness for providing testimony before the committee on such an important issue, and I ask consent to include other statements and information submitted to the committee along with the hearing record.

With that, I recognize our distinguished Ranking Member, former Chairperson Senator Stabenow, for any remarks that she would like to make.

STATEMENT OF HON. DEBBIE STABENOW, U.S. SENATOR FROM THE STATE OF MICHIGAN

Senator STABENOW. Well, thank you very much, Mr. Chairman, and I also want to thank the administration officials that are here and all of the food industry leaders for testifying today. Your comments, your perspectives are very important to us and I look forward to hearing your testimony.

I agree that throughout the history of our country, American agriculture has been at the forefront, developing cutting-edge technology, from John Deere's invention of the steel plow, to Norman Borlaug's use of novel plant breeding techniques to create high-

yielding wheat that has helped prevent hunger and famine around the world.

Today, that same spirit of innovation is helping drive agriculture production and efficiency to amazing new heights. A growing global population, coupled with the effects of climate change and the stress placed on much of our natural resources, has created a sense of urgency for new innovations if we are to maintain our nation's agricultural leadership.

That is one reason why I support the use of biotechnology in agriculture. Biotechnology has proven to be safe, beneficial, and I believe will play a major role in helping to solve these dual global challenges of climate change and global food security.

I also recognize the desire by a growing number of American consumers to know more about the food they eat. This growing demand for information is one reason why in the 2014 farm bill we had unprecedented investments in areas like organic production and local food systems, which help ensure consumers have increased choices.

As we know, several states have passed laws to disclose more about the production of food, and I believe this issue will only continue to build steam in the months and years ahead. I share the concern about the difficulty in doing business across our country if 50 different states have 50 different standards and requirements, and, frankly, it will not work. However, we also need to recognize and respect the interests of many American consumers who care deeply about where and how their food is produced.

In order to address legitimate concerns from our farmers, our food companies, our consumers, I believe we need to work together, and I am committing myself, Mr. Chairman, to do that in a bipartisan way, to develop and pass a bill that can pass the Senate by the end of the year. This needs to move quickly in order to address these issues, and I believe they need to meet the following tests.

First, a solution that addresses the problem of a 50-state patchwork of regulations.

Second, a national system of disclosure and transparency for consumers who wish to know more about their food.

Third, an approach that does not stigmatize biotechnology.

Nearly 30 years ago, the White House Office of Science and Technology Policy established the Coordinated Framework for the Regulation of Biotechnology. Since its inception, this framework has helped establish what sound oversight of agricultural biotechnology must be. With the continued development and increased use of biotechnology and other science-based breeding techniques, it makes sense that these standards are revisited, and I applaud the administration for taking that step earlier this summer. Ensuring that the Coordinated Framework is updated to reflect the latest research and science on biotechnology will help instill additional confidence about the safety and soundness of the use of these technologies.

As we look at updating the rules to reflect advancements in biotechnology, it makes sense that we examine the way in which consumers have access to the information they need to make informed decisions about the food they eat and purchase for their families.

As members of this committee, we recognize that American farmers and ranchers are the best in the world and they use the most sophisticated farming practices to produce the most abundant and safest food supply in the world. We should strive to build confidence in these technologies so that all consumers can better understand their benefits and recognize and appreciate the role of innovation in American agriculture today.

Mr. Chairman, I look forward to working with you on this issue. I know this is a very important hearing today.

Chairman ROBERTS. I want to thank the distinguished Ranking Member, and we will be moving with legislation as quickly as possible.

Welcome to our first panel of witnesses before the committee this morning. Our first panelist is Mr. Gregoire, who serves as the Associate Administrator of APHIS. In addition to a focus on the agency's policy, budget, and administrative responsibilities, he manages the biotechnology and regulatory services as well as the plant protection and quarantine issue areas. Welcome, and I look forward to your statement.

STATEMENT OF MICHAEL GREGOIRE, ASSOCIATE ADMINISTRATOR, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC

Mr. GREGOIRE. Thank you very much, Chairman Roberts and Senator Stabenow and members of the committee. Thank you for the opportunity today to appear before you and discuss an important topic to American agriculture, that is the complex issues surrounding biotechnology and the federal government's role in regulating it.

I am Michael Gregoire, Associate Administrator of USDA's Animal and Plant Health Inspection Service. APHIS is responsible for ensuring that new biotechnology products do not inadvertently harm plant health in the U.S.

APHIS regulates the importation, the interstate movement, and field testing of genetically engineered organisms. Our specific role is to ensure that new GE crops do not pose a risk to plant health, such as causing disease or damage to other crops or plant products in the United States.

If a GE product requires USDA's oversight, developers must apply for an APHIS permit and adhere to APHIS regulations to maintain adequate confinement of a regulated organism during field trials. After developers have the scientific information which they believe is sufficient for us to conclude that a GE organism is unlikely to pose a plant pest risk, they can petition APHIS for nonregulated status.

We then prepare an appropriate plant pest risk assessment and environmental analysis that informs our decisions. If our officials conclude then that a GE organism does not pose a plant pest risk, APHIS deregulates the product and that organism may be freely moved or planted without further APHIS oversight and permits or other regulatory requirements.

Over the years, APHIS has—over the recent years, APHIS has undertaken a process to significantly improve the timeliness of our biotechnology regulatory decisions. We have been able to provide a

more timely review process that does not sacrifice the thoroughness or the quality of our scientific reviews while also giving the public an additional opportunity to provide us with input.

APHIS has completed 30 of the 37 pending and new petitions since implementing our new process in March of 2012, and we plan to complete three more by the end of this year. Since March of 2012, we have also cut the time down for review of new petitions from between three to five years to just over 18 months, and we are on a course to get that down to more like 15 months, on average.

Again, APHIS's authority to regulate GE products is based on their potential plant pest risk. We regulate based on the specific product and the environment into which it is being introduced, not the production process that created the organism. Developers may seek a written determination from us if they are unsure whether or not their product requires regulatory oversight.

We work regularly with the Food and Drug Administration and EPA to ensure that the development, testing, and use of biotechnology products happens in a way that is safe for plant and animal health, human health, and the environment. We regularly communicate with our colleagues in FDA and EPA to ensure that any safety or regulatory issues that may arise are appropriately resolved. We have great confidence in the safety of the GE crops that have been approved under the U.S. regulatory system.

Recently, the Executive Office of the President released a memo that directed our three agencies to work with them to update the Coordinated Framework of 1986, and we are working very closely with our colleagues on this review and update.

Complementing the interagency effort to update the Coordinated Framework is our renewed effort in USDA to revise and update APHIS's regulations. We plan to align our regulations with current authorities and regulate GE organisms that pose a plant pest or weed risk in a manner that balances oversight and risk and that is based on the best available science. We plan to continue to engage the public throughout the rulemaking process and will provide ample opportunities for public input in that process.

To summarize, USDA is committed to a sound, science-based and modern approach to the regulation of products derived from biotechnology. We will continue to work with our federal partners and stakeholders as we build upon the many years of our work in this area.

Mr. Chairman, that concludes my opening remarks.

[The prepared statement of Mr. Gregoire can be found on page 56 in the appendix.]

Chairman ROBERTS. Thank you very much for your statement.

Our next witness is Mr. Bill Jordan. He joins us today as the Deputy Director for EPA's Office of Pesticide Programs, and I understand that he has plans to retire at the end of the year, after a distinguished career in public service. Maybe we can talk you out of that here this morning.

[Laughter.]

Chairman ROBERTS. He has worked in several capacities in the Office of Pesticide Programs since 1988 and previously served in the EPA's Office of General Counsel.

I look forward to your testimony and your experience, sir.

STATEMENT OF WILLIAM JORDAN, DEPUTY DIRECTOR, OFFICE OF PESTICIDE PROGRAMS, U.S. ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC

Mr. JORDAN. Good morning, and thank you, Chairman Roberts and Ranking Member Stabenow and members of the committee. I appreciate the chance to testify about EPA's role in regulating products of biotechnology.

EPA administers two strong laws, FIFRA and the Food, Drug, and Cosmetic Act, to regulate pesticides, a term that includes genetically engineered plants that express pesticidal properties. We call a pesticide like that a plant incorporated protectant, or PIP, for short. I will be talking a lot about PIPs.

Under FIFRA, we register pesticides to ensure that they are used in a way that is safe for humans and the environment, and in order to obtain a registration, an applicant must demonstrate that the pesticide will not cause unreasonable adverse effects on humans or the environment.

EPA also regulates the safety of pesticide residues in food under the FFDCA by establishing maximum residue limits, called tolerances. Here, we may establish a tolerance only if there is a reasonable certainty that no harm will result from exposure to pesticide residues.

As described more fully in my written testimony, EPA's regulation of PIPs and other pesticides is guided by several principles. First, our decisions are based on the best available science.

Second, we operate with consistency and fairness in a transparent manner.

Third, we collaborate with our partners at USDA and FDA.

I want to emphasize the important role that science-based risk assessment plays in our regulatory process. When making decisions about PIPs, the Agency knows we must be fully informed by the best available information and expert advice. So, EPA requires applicants for registrations and tolerances to provide extensive data on their PIPs. EPA's staff experts carefully review all of this information to see if a product meets the safety standards in our statutes. EPA also has sought advice from external independent experts on biotechnology through nearly two dozen meetings of the FIFRA Scientific Advisory Panel. At the end of the day, we are very confident that we can stand behind our conclusions that the PIP products we approve meet the demanding protective standards of FIFRA and FFDCA.

We have approved 86 PIP registrations. Most of these are for products that produce a protein that is toxic to particular kinds of insects, but has practically no effect on humans or other species. Growers have widely adopted PIP products. Today, tens of millions of acres are being planted with EPA-approved varieties of PIPs.

A number of groups, including the National Academy of Sciences, have studied how the introduction of PIPs has affected the use of synthetic chemical pesticides. These experts concluded that by planting PIPs, growers have reduced by many millions of pounds their reliance on broad spectrum synthetic insecticides. The result is less exposure to such pesticides for workers and non-target wild-

life, less ground and surface water contamination, and less pesticide residue in food. In addition, PIPs solve pest problems that conventional chemical pesticides have not, as shown with the plum pox example described in my written testimony.

The use of PIPs in agriculture has already produced real benefits, but we cannot say that future products will always be risk free. Therefore, before a new PIP is introduced into the environment, it is important that EPA have sufficient data and opportunity to evaluate the potential for risks. In addition, because PIPs have proven to be effective and safer alternatives to conventional pesticides, EPA believes they should be managed in a way that preserves the technology long into the future. That will likely require controls on the use of PIPs to prevent the development of pest resistance.

In sum, EPA recognizes the potential benefits that products of modern biotechnology can bring to agriculture and the environment, and we also believe the country needs a strong, effective, and efficient regulatory system that embodies the principles of sound science, transparency, and collaboration. We believe we have such a system at EPA, and working with our colleagues at FDA and USDA, we look forward to continuing to fulfill our responsibility for ensuring the safety of products of modern biotechnology.

I would be happy to answer questions later.

[The prepared statement of Mr. Jordan can be found on page 76 in the appendix.]

Chairman ROBERTS. We thank you, Mr. Jordan.

We have both of our witnesses finishing exactly on time. We may set a record here this morning.

[Laughter.]

Chairman ROBERTS. Our third witness, Dr. Susan Mayne—I did not mean to put that on your shoulders——

[Laughter.]

Chairman ROBERTS. —comes to us from the FDA Center for Food Safety and Applied Nutrition. Dr. Mayne has served as the Director of FDA's Center for Food Safety and Applied Nutrition since January 2015. In this role, she leads the Center's efforts related to the composition, the quality, the safety and labeling of foods, food and color additives, and cosmetics. Previously, Dr. Mayne was the C.-E.A. Winslow Professor of Epidemiology and Chair of the Department of Chronic Disease of Epidemiology at the Yale School of Public Health, as well as Associate Director of the Yale Cancer Center.

Welcome. I look forward to your testimony and your insight.

STATEMENT OF SUSAN MAYNE, PH.D., DIRECTOR, CENTER FOR FOOD SAFETY AND APPLIED NUTRITION, FOOD AND DRUG ADMINISTRATION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, COLLEGE PARK, MARYLAND

Ms. MAYNE. Thank you, Chairman Roberts and Ranking Member Stabenow and members of the committee. Thank you for the opportunity to be here today to discuss FDA's regulatory program for genetically engineered, or GE, foods.

Over the last 20 years, FDA has reviewed information on more than 150 plant-derived GE foods, ranging from herbicide-tolerant

soybeans to canola oil with a modified fatty acid profile. Based on our evaluations, we are confident that the GE foods in the U.S. marketplace today are as safe as their conventional counterparts.

The selection and genetic improvement of plants for agricultural use has been going on for thousands of years, typically through cross-breeding and hybridization. Many of the foods that are common in our diet, such as hybrid corn or nectarines, are obtained from plant varieties that were developed using such conventional genetic cross-breeding techniques.

Since the late 1980s, by inserting one or more specific genes into a plant, scientists are able to produce a plant with new, advantageous characteristics. These techniques give scientists the ability to isolate specific genes of interest and introduce them and their corresponding traits into plants without introducing undesirable genes and traits.

Any of these genetic modification techniques has the potential to change the composition of a food in a manner that is relevant to food safety. FDA, however, has well established scientific procedures for evaluating the safety of new foods, including any new substances in a food, and our guidelines help developers address any safety concerns prior to marketing.

FDA regulates the safety of all foods within our authority, including those derived from GE plants, under the Federal Food, Drug, and Cosmetic Act. Foods developed from genetically engineered plant varieties such as fruits, vegetables, grains, and their byproducts, are subject to the same safety requirements as foods derived from non-GE plants. Food growers, manufacturers, and distributors are responsible for taking the steps necessary to ensure that their products are safe.

To help developers of food derived from GE plants comply with their safety obligations, the agency encourages participation in our voluntary consultation process prior to commercial distribution. Since the consultation process was created, developers of GE plants have completed the process more than 100 times. Typically, the consultation begins early in the development, when the agency advises the developer on what tests would be appropriate to test safety. After the studies are completed, a summary of the data reflecting safety and nutritional composition are provided to FDA for review.

FDA expects developers of GE foods to analyze the composition of the foods from their new crop varieties to ensure that any changes compared to the food's conventionally derived counterpart are appropriately considered and addressed before marketing.

As part of our review and analysis, we consider whether any newly introduced protein is likely to be allergenic or toxic and whether levels of any important nutrients have been changed in a way that is important to food safety or nutrition. We also consider whether any newly introduced protein requires pre-market approval as a food additive.

Examples of the information evaluated by FDA include the name of the food and the crop from which it is derived; the sources, identities, functions, and stability of introduced genetic material; the purpose of the modification and its expected effect on the composition and characteristics of the food; the identity and function of any

new substances introduced by the genetic material; a comparison of the composition and characteristics of the GE food to that of the parental variety; and information on whether the genetic modification altered the allergic or toxic potential of the food.

FDA also regulates the labeling of food, including GE foods, under the Act and our regulations. The Act establishes that a food is misbranded if its labeling is false or misleading. Labeling is misleading if it fails to reveal facts that are material with respect to representations made or suggested in the labeling or if it fails to reveal consequences that may result from the use of the food.

FDA has taken the position that the use of genetic engineering in the development of a food is normally not by itself material information within the meaning of the Act. Federal courts have held that FDA's position that the use of genetic engineering by itself does not constitute a material fact or require labeling to indicate that the food has been developed through genetic engineering is entitled to deference.

Finally, I want to note that FDA is engaged with our colleagues at USDA and EPA to implement the activities laid out in the 2015 memorandum on modernizing the regulatory system for biotechnology products. On October 30, at our campus in Silver Spring, Maryland, FDA will host the first of three public meetings to involve the public in this modernization effort.

In closing, I want to assure you that FDA's consultation process for foods derived from GE plants works well and provides for a rigorous food safety evaluation of GE foods. The agency will continue to be vigilant in ensuring the safety and integrity of the nation's food supply. Thank you.

[The prepared statement of Ms. Mayne can be found on page 94 in the appendix.]

Chairman ROBERTS. We thank you.

This is for all witnesses with regards to my question. Based on the best available science at your agency, do you believe that biotechnology is safe? Additionally, how does the regulatory scrutiny for agriculture biotechnology compare to the regulatory review process for other food ingredients at your respective agencies? Mr. Gregoire.

Mr. GREGOIRE. Yes. Thank you, Mr. Chairman. We are very confident in the safety of the products that we have reviewed through our regulatory process. The genetically engineered crops that we review in terms of the plant risks that we review, they get more scrutiny than would, say, conventional bred crops.

Chairman ROBERTS. Mr. Jordan.

Mr. JORDAN. We, too, at EPA are very confident in the judgments that we have made about the safety of the PIP products that we have reviewed. The PIP products, pesticides and conventional pesticides, must meet the same rigorous safety standard, and we require companies to give us as much data as we need in order to make that decision. So, both conventional pesticides and PIPs are rigorously examined.

Chairman ROBERTS. Dr. Mayne.

Ms. MAYNE. As I indicated before, we have had a long established pre-market consultation process. To our knowledge, all of the firms that are intending to commercialize GE plants in the U.S.

have consulted with FDA prior to marketing. As I indicated, we review newly inserted DNA protein product, allergenicity, potential toxicity. We look for key nutrient changes, toxicants, et cetera. So, our process is rigorous. Our process is thorough. It is consistent with how we regulate food in general under the Federal Food, Drug, and Cosmetic Act.

Chairman ROBERTS. A second question for all witnesses. When the White House Office of Science and Technology Policy announced the review of the Coordinated Framework for the Regulation of Biotechnology in July, key objectives included ensuring public confidence in the regulatory system and preventing unnecessary barriers to future innovation and competitiveness. How can the three agencies and the administration, as well as this committee, do a better job, especially conveying to the public their belief in science and risk-based work of the agency experts? Will this process help convey more confidence to the public? Mr. Gregoire.

Mr. GREGOIRE. Yes, Senator, I believe it will. The process that we have undertaken will look at clarifying roles and responsibilities of the three agencies in the regulatory oversight. It will position us for the future products of biotechnology and we will also be getting outside expert review of the future landscape of biotechnology. So, the purpose is really to make the overall system more clear and transparent and predictable, both for developers and for the public.

Chairman ROBERTS. Mr. Jordan.

Mr. JORDAN. I agree with Mr. Gregoire and I would only add that the process going forward by which we intend to update the Coordinated Framework and develop a long-term strategy will include, as Dr. Mayne has noted, opportunities for public input. We are hoping to learn from that feedback how to do our job as well as we possibly can.

Chairman ROBERTS. Dr. Mayne.

Ms. MAYNE. So, I concur with that. We are—FDA is committed to work with the other agencies to update the Coordinated Framework after we have had public input into the process. We will be looking towards long-term strategies to thinking about how we can assure that this is working as effectively as possible into the future. We look forward to the input from independent analyses, from National Academies and others, as to how we can do this most effectively.

Our goal through this process is to provide clarity to the regulatory process to encourage innovation while we are managing risks, and we look forward to that process.

Chairman ROBERTS. Speaking for all members on this committee, we will continue our oversight responsibilities in a partnership effort with you. This is the first time, I think, for Senator Stabenow, for ten years that we have had a hearing on biotechnology. So, I guess we are a little late, but we are here.

Senator Stabenow, please.

Senator STABENOW. Well, thank you very much, Mr. Chairman, and again, thanks to each of you for your testimony.

I would like to just expand a little bit more on what the Chairman was talking about in terms of the 1986 Coordinated Framework that you are now involved in updating, and I think the objec-

tive is a really important one, quote, "ensure public confidence in the regulatory system and to prevent unnecessary barriers to future innovation and competitiveness by improving transparency, coordination, predictability, and efficiency of regulations." So, that is a lot and it is also very, very important to do.

I wonder if you could expand a little bit as you look at how you have seen technologies evolve in recent years and how that will inform you as you are looking to update the plan. I wonder if each of you might. Mr. Gregoire, you might go first.

Mr. GREGOIRE. Yes. Thank you for that question. Certainly, the science has advanced greatly since the Coordinated Framework was put into place and the technology is changing rapidly. There are a lot of new plant breeding techniques that have been developed that allow developers to confer traits with more precision more quickly than conventional breeding and at less cost. So, there are many different advances in this technology.

Senator STABENOW. Thank you.

Mr. Jordan.

Mr. JORDAN. Thank you, Senator. One of the changes that we at EPA think is very encouraging is that technology developers have been able to combine different genetically engineered traits into a single plant, making the plant's ability to resist different kinds of insects and to deal with pest resistance more effective. I think, is a notable advance in the technology in recent years.

As Mr. Gregoire has indicated, companies, technology developers, are extraordinarily innovative in terms of the ability that they—the variety of products that they are bringing to us, and because those products are different, then we need to be able to be clear, first, about which agency has responsibility for regulating them, and then to look carefully at how the different types of products may present different issues in terms of risk and environmental effects.

Senator STABENOW. Dr. Mayne.

Ms. MAYNE. So, the science has evolved and continues to evolve, the techniques for doing this type of genetic engineering, and our scientists attend the same conferences, read the same scientific journals, and do all they can to stay abreast of advances in science and technology.

In some cases, we have to stay abreast of all the science, but that also presents opportunities, and one example is that through the genomic revolution, we now have the ability to have sequences on all kinds of different things. We now have the ability to, for example, screen proteins against known sequences for proteins that have allergenic potential. So, we have better tools now to identify things like potential allergenicity through advances in science and technology.

Senator STABENOW. Thank you.

Just a comment, Mr. Chairman. One of the things that I find frustrating on this issue, and I have said it to so many people who are involved in doing the technology and so on, is really breaking this down in a way that the public can understand that does not sound scary, because the reality is, and I will never forget reading a great book called Our Daily Bread about Norman Borlaug, and we now have a statue of him in Statuary Hall, and to look at what he did both in the field and laboratory and starting in 1944 with

the Rockefeller Foundation. Then he spent decades doing basically what can be done in a lab now. It is speeding up what he did. That is how I view this.

So, he spent decades trying to create a situation where there was broader and more stable disease resistance and higher yields. He was called the Father of the Green Revolution. He got a Nobel Peace Prize for literally saving millions of people by feeding people around the globe because of the work he did. Now, because we can do this in a laboratory faster rather than taking decades, it has now become a whole other thing that we talk about.

So, one of my frustrations is the fact that this is not explained well at all, or understood. Is there anything that all of you are doing that will help sort of break this down? I mean, this is about how we—just as we do better medical research in a lab than we used to do, with technology, we are now doing better plant science and seed science than we used to do because of technology. We, I think in general, as a country, and industries have not explained this very well, and it is very unfortunate.

So, I do not know if there is anything that you are involved in that will help make that more clear about what that means in terms of how science is positive in this sense or not, but it certainly would be helpful. I do not know if anybody wants to respond to that or not. That is more of an editorial comment, Mr. Chairman, but if anyone would want to respond. I do not know if the Framework does anything to translate this into real world for people and why this is positive in terms of health and safety, but is that anywhere in the Framework or not? I do not know.

Ms. MAYNE. Well, I would just——

Chairman ROBERTS. Feel free.

Ms. MAYNE. I would just say, at the end of this process, I would hope that the public would have greater confidence and that we will continue to try to communicate the strength of the science, as you hear today, that we have confidence in the safety of these products, in the case from FDA, for the food supply.

Senator STABENOW. Thank you. Thank you, Mr. Chairman.

Chairman ROBERTS. Thank you, Senator. Your sense of frustration folds very neatly into our challenge here on the committee. This is the first time in ten years that we have had a hearing on biotechnology, and we have experts that have testified basically to the American public that biotechnology is safe. Each of us have our megaphones that we can talk to our farmers and ranchers and all of agriculture, and, for that matter, the food industry. But, it is a challenge and I thank you for bringing that up.

Senator Thune.

Senator THUNE. Thank you, Mr. Chairman, and thank you for being a pioneer on this subject. It is important. It is the first one—I did not realize, the first one in ten years, but it is an important subject, so thank you to you and Ranking Member Stabenow for bringing this issue in front of us.

It goes without saying that biotechnology has provided my home State of South Dakota and its number one industry, agriculture, with dramatic yield increases, drought tolerant crops, sustainability, and economic benefits that far exceed expectations from ten or 20 years ago. Farmers in South Dakota and across the United

States take great pride not only in the amount of the crops that they produce, the number of people they feed, but most importantly in the safety of the food supply they provide, not only for the United States and global populations, but also for their own families.

Now, based on testimony that is provided and going to be provided at today's hearing, I am greatly concerned that just like many other areas of regulatory overreach, future regulation of our biotechnology crops, especially regarding the approval process, could become much more cumbersome and complicated and send the wrong message to our trading partners overseas, which could be very detrimental to my home state, as it depends heavily on export markets.

Additionally, the uncertainty that is created by states individually passing mandatory GMO labeling laws would be devastating to producers, as our supply chains are much too complex to meet the needs of 50 different states.

So, I start with that. I have a couple of questions I would like to ask, and I want to direct this one first to Mr. Jordan, because opponents of biotechnology have been raising questions about the safety of glyphosate herbicide with certain GM crops, notwithstanding its 40-year history of safe use, and the fact, by the way, that no regulatory agency in the world considers glyphosate to be a carcinogen.

In April of this year, EPA issued a desk statement regarding glyphosate and the IARC conclusion. In this statement, EPA stated, in part, and I quote, "In 2014, EPA reviewed over 55 epidemiological studies conducted on the possible cancer and non-cancer effects of glyphosate. Our review concluded that this body of research does not provide evidence to show that glyphosate causes cancer and it does not warrant any change in EPA's cancer classification for glyphosate. This is the same conclusion reached in 2004 by the United Nations Food and Agriculture Organization and affirmed this year by Germany's pesticide regulatory officials." That is the end of the quote.

So, I just want to ask you the question, can you confirm that this is the most recent public statement EPA has issued addressing the safety of glyphosate?

Mr. JORDAN. Yes, sir, that is the most recent statement that we have issued on that, and I helped write it with the input of the experts at EPA. We are currently reviewing the IARC report and we expect by the end of this year, possibly sooner, to have another statement addressing that document.

Senator THUNE. You in your testimony, when discussing regulation of plant incorporated protectants, or what you referred to as PIPs, that, quote, "Our decisions are based on the best available science. We operate with consistency and fairness in a transparent manner and we collaborate fully with our regulated partners in the Coordinated Framework," end quote. Then you went on to say that the EPA believes we have a responsibility to convey to the public that our decisions are consistent, scientifically solid, and fully protective of human health and the environment.

Based on the collaborative efforts of EPA, FDA, and USDA APHIS using sound science to ensure food safety, especially for

foods derived from genetically engineered plants, do you believe consumers need mandatory labeling of foods produced from GMO plants?

Mr. JORDAN. Sir, I believe that the genetically engineered plants that we have reviewed do not pose any risk in the food supply. It is not EPA's purview to address labeling questions, but that lies with FDA.

Senator THUNE. Okay, and thank you for that nice segue there. Dr. Mayne, you provide in your testimony the FDA is supportive of voluntary labeling that indicates whether foods have or have not been developed through genetic engineering, provided that such labeling is truthful, not misleading. You also provide in your testimony that, and I quote, "FDA's voluntary pre-market consultation process provides for a rigorous food safety evaluation of foods derived from genetically engineered plants. As a result of these premarket consultations, we are confident that foods derived from GE plants in the U.S. marketplace today are as safe as their conventional counterparts," end quote.

So, if you are confident that foods derived from GE plants are just as safe as foods derived from conventional counterparts, does not the whole idea that you put forward of labeling send a mixed message?

Ms. MAYNE. So, if we were to require mandatory labeling, that would be a different interpretation. As I indicated previously, there is no basis for us to require labeling based upon a material difference in the products, and federal courts have upheld that position. We recognize consumers want to know this information, and that is why FDA has issued guidance on voluntary labeling procedures for industry. So, mandatory labeling also has some enforcement challenges, and so it is not grounded in science or in the basis of our authority to require mandatory labeling.

Senator THUNE. I would like to continue that line of questioning, Mr. Chairman. My time has expired, so I will perhaps get it on another round or submit some questions for the record.

Chairman ROBERTS. The Chair would inform the distinguished Senator that he will be granted any time after the members present have their questions. You have flown at 2,000 feet. We have been flying at 30,000 feet, so, obviously, those are some very pertinent questions.

Let us recognize the former distinguished Chairman of the committee, Senator Leahy, who I am sure has very interesting questions. Senator Leahy.

Senator LEAHY. I have just been fascinated by all the questions already asked. Mr. Chairman, and Ranking Member Stabenow, I appreciate you holding this hearing, bringing together a diverse panel of witnesses. As I have mentioned to you both, I have to go off to another scheduled event and so I will not be able to stay much longer.

I just wanted to, before I left, welcome a fellow Vermonter, Joanna Lidback of Barton, to the committee. She and her husband have worked very hard on this subject. We also had a chance to talk about the foliage in Vermont. That is a view off my front lawn.

Senator STABENOW. Rub it in.

[Laughter.]

Senator LEAHY. It probably is different in Kansas, but——

Chairman ROBERTS. Did you want to hold that up and——

Senator LEAHY. No, no, no. It would sound too much like bragging and we never do that in Vermont even though we have the best——

Chairman ROBERTS. I cannot see anything for the trees.

Senator LEAHY. We do not brag about it, because even though we do have the best foliage in the world, but——

[Laughter.]

Senator LEAHY. —but we will not brag. I know that—Joanna, I do appreciate the amount of time you spent talking to my staff and others. I know you are going to bring a unique perspective on biotechnology to the hearing. I also note that she, like other farmers in Vermont and throughout our country, take great pride in providing safe, nutritious food for all of us, and this is a complicated issue. I hope we are going to hear from even more witnesses, to reflect the broad scope of issues at play.

Mr. Gregoire, you mentioned in your testimony that the USDA regulates GE crops under its plant pest authority provided by the Plant Protection Act, but the Plant Protection Act, when it was considered by Congress back in 2000, did not include any language relevant to GE crops. In the legislative record, I have gone back, I do not see anything in it that says Congress intended to address GE crops. So, it is a kind of narrow hook, suggesting the remote possibility that GE crops could become a plant pest. We have many new GE crops that are not made using plant pests in their development, so they fall outside USDA's regulatory authority. Will the proposed rule on risk-based regulation address this, or are we trying to put a square peg in a round hole?

Mr. GREGOIRE. Thank you, Senator, for that question. You are correct that the Plant Protection Act does not specifically address biotechnology or genetically engineered crops, nor does it define any plant breeding methodology per se. What that Act provides the Secretary is very broad authority to prevent the introduction and dissemination of plant pests and noxious weeds in the U.S. to protect the health of our agriculture industry. That is really the focus of the mission of our agency, and it is through this lens that we look at the products of biotechnology as we would look at any other organism that might present a plant pest——

Senator LEAHY. The reason I get this, we seem to have conflicting agencies. Those who oppose the labeling and regulations often point to the FDA's policy statement from 1992 that GE foods can be marketed without labeling because they are not materially different from other foods. But that is in sharp contrast to the U.S. Patent and Trademark Office, which holds that GE foods are novel for patent purposes.

So, I ask both Dr. Mayne and Mr. Gregoire, is it defensible to maintain that GE foods are not materially different from other foods when the U.S. PTO recognizes them as a novel invention? Help a layman out here. I am new to all this kind of thing——

Mr. GREGOIRE. Well——

Senator LEAHY. —after 40 years.

Mr. GREGOIRE. So, some of the things that we look at in our reviews for a new GE crop are: does the trait that has been put into

this plant cause disease or damage to other plants or plant products? Does the trait make the plant more weedy? Things of that nature. Again, what we are trying to get at is not so much how it was transformed, but if the product of the technology has potential to cause physical damage or harm to other agriculture, and what we have found in every one of the 117 deregulations that we have done, is that those plants are essentially no different in those regards than their conventional counterparts.

Senator LEAHY. Dr. Mayne, what do you have to say about the U.S. PTO?

Ms. MAYNE. Again, from the materiality difference, we look to see whether these foods are any different from their conventional counterparts with regard to issues of food safety and nutrition. So, we do not look at the production method. That is not what we consider in the materiality. What we look at is the food itself and are the characteristics of the food itself materially different from the conventional counterparts. As a class, we have concluded that they are not materially different.

If they were, if there were a material difference, then we would want that labeled. So, for example, if there was a different nutritional content, we would indicate that, for example, high oleic acid soybean.

Senator LEAHY. Thank you.

Thank you, Mr. Chairman, and I would ask consent to submit some questions for the record.

Chairman ROBERTS. Without objection. I would offer only the comment that every member is certainly free to put a picture of their state on the front of their briefing book, but comments therein will be limited to raising them on high and mentioning them for ten seconds.

[Laughter.]

Chairman ROBERTS. I would also offer the opinion that neither one of us should be talking about foliage.

[Laughter.]

Senator LEAHY. I think we are referring to a different type.

Chairman ROBERTS. Yes.

[Laughter.]

Chairman ROBERTS. Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman, and I thank the panel for being here. We appreciate all that you all do to ensure that our food is safe.

Chairman ROBERTS. Yes.

Senator BOOZMAN. Again, thank you to the Chairman and Ranking Member for having this very, very important hearing.

Mr. Jordan, all of you have—well, first of all, all of you have stated that the biotech crops are safe, and Mr. Jordan, in your testimony, you mention that PIPs have had positive impacts in the environment and that they are safer than conventional pesticide. Can you elaborate on the benefits you have seen from PIPs?

Mr. JORDAN. Certainly. First and foremost, farmers are adopting the PIP technology because it works. It is effective at controlling the pests. So it meets their needs.

Secondly, PIPs, the ones that we have reviewed and that have been so widely adopted, use a genetic material from a bacterium

called Bacillus thuringiensis. It is a common soil microbe that actually has been adapted to use in the organic program, and it produces a protein that is harmful to the insects that eat corn or soybeans or other crops, and it kills those insects but it has virtually no effect on any other species. So, it is safer than conventional broad spectrum pesticides, chemical pesticides that not only affect the target insect, but also other insects and sometimes other species in humans, as well. By using PIP plants, there has been less use of those conventional pesticides and that means less pesticide residues in our food and our water, less exposure for workers and wildlife.

Senator BOOZMAN. Thank you, Mr. Jordan.

Dr. Mayne, I have heard from folks asking about the FDA's premarket consultation process. To me, it would seem to be in the developer's interest to consult with the FDA both for safety and trade reasons. Can you walk us through the FDA pre-market consultation process.

Ms. MAYNE. Certainly. So, the way the process works is we encourage the plant developers to come in to us early in the process, in part because we can help to identify the types of data that might be needed to review the safety of that process. So, it is a voluntary consultation process. They can come to us multiple times to get the package of data information together that they would submit to the agency and then we would review that evidence for safety.

Senator BOOZMAN. So, you have got confidence in the process.

Ms. MAYNE. We do have confidence in the process.

Senator BOOZMAN. How long does it take?

Ms. MAYNE. So, the time is variable, depending upon, like, when do we start the clock when they first come to us. But once the package is together and once they have submitted that information to us, generally, it takes between one and two years to complete the final consultation.

Senator BOOZMAN. Yes. Has any developer of a biotech plant ever not followed your pre-market consultation process?

Ms. MAYNE. In terms of our consultation process, we are not aware of anyone that has not gone through the consultation process that has then commercialized a product into the U.S. market.

Senator BOOZMAN. How does the regulatory scrutiny that biotech crops undergo compare to the regulatory process for other food ingredients?

Ms. MAYNE. Again, we use the same safety standards, the same legal standards for conventional as well as for food produced through genetic engineering.

Senator BOOZMAN. Mr. Gregoire, does the USDA have full authority to regulate any plant in the U.S. if it is shown to be a pest, even if it is a biotech crop?

Mr. GREGOIRE. Yes, Senator. The Plant Protection Act gives the Secretary very broad authority to take measures to control, prevent, mitigate the introduction or dissemination of plant pests in the U.S. So, regardless of how that may have been created, we do have that authority and that ability.

Senator BOOZMAN. Very good. Thank you, Mr. Chairman. Thanks to the panel. So far, your information has been very, very helpful. We appreciate you coming.

Chairman ROBERTS. I thank the Senator, very pertinent questions.

Senator Heitkamp.

Senator HEITKAMP. Thank you, Mr. Chairman.

I am going to take this in a little different direction because I do not think there is anyone on this committee who has not reviewed the science and who does not believe everything that you are saying. This is not a new issue. During the 1990s, I served on something called Trade and the Environment Policy Advisory Committee for the USTR where European labeling of genetically engineered foods was starting to surface as an issue in terms of a trade barrier. We know that there has been a growing and brewing controversy around this kind of technology, for good or bad.

You take a look at the fight that we are fighting right now on vaccines, the fight that we are fighting on pasteurized milk. You can go down the list. All these technologies that have really helped create more food, helped keep our food safe and are being challenged all the time.

I have a question that goes to maybe not the regulatory scheme, but goes to why it is that we have this controversy given the unanimous consent of all of the regulatory agencies that these products are safe. What is it that we are not doing in terms of making the information that you provide more accessible to the average consumer so that they understand? We are up against a huge social media network where things get said that should be challenged, but yet we do not seem to find the way to challenge them.

My question for all of you is how can you make the information that you utilize to make these determinations more accessible to the American public in a way that they understand and that they have confidence in the work that you have done. We would start with the FDA.

Ms. MAYNE. So, that is a challenging question. It is a communications issue, and we do work with a very talented communications team every time we have new information that we put out onto the market. I have only been at the agency for nine months, but I can tell you, for example, we recently finished a consultation process on two new genetically engineered products. One was an Arctic apple. The other was a potato. We put the information out in the media, and to my surprise, we did not have much media attention.

So, I am thinking that the times are changing and perhaps we are getting more embracing of the genetic engineering and the technology and how it can be used. But, it is really a communications challenge and we need to go to our most trusted communicators to communicate that to our public.

Senator HEITKAMP. Dr. Mayne, if it were getting more acceptable we would not be in this room with a room full of people.

Ms. MAYNE. Yes.

Senator HEITKAMP. I think that is pretty clear. There is something about what we are not communicating in terms of the science that is not getting through.

Mr. Jordan, can you offer any comments?

Mr. JORDAN. I will try. It is a very challenging issue, and I think the general decline in confidence in all parts of government plays

a role in this. For what it is worth, we at EPA believe that doing our work transparently, making available all of the information, all of our analysis that underlies our decisions, seeking outside experts who do not have government affiliations to weigh in on difficult issues is the way that we as government can demonstrate that we are doing a responsible, effective job of making decisions.

Senator HEITKAMP. Except what people hear is "blah, blah, blah, blah, blah."

Mr. JORDAN. I know that.

Senator HEITKAMP. I think that is a serious problem as it relates to what we are trying to do, because we are talking about how do we provide consumer information, information consumers want, versus what consumers need. That really is what we are talking about here, and I believe the science is so strong in this area that these are products that will not have an adverse effect in any way on health, in fact, can improve health by making it more accessible worldwide, food products worldwide. But, yet, we seem to be losing, I think, the fight, not just on labeling, but losing the fight on how we are going to make these products more acceptable.

I think, Mr. Gregoire, maybe you can offer some comments, as well.

Mr. GREGOIRE. Yes. Thank you. It is certainly very, very challenging to explain to the public very complex scientific issues. Some of the things that we do, all of the analyses that we do are made available to the public. Any regulatory decisions we make, we call attention to those decisions either with a press release or an e-mail to our stakeholders to let them know the decisions that we have made and how we have made those. We do have an annual stakeholder meeting where members of the public can——

Senator HEITKAMP. I am out of time. I just want to make one final point, if I can. The data that you are presenting and the information you are presenting is not presented in a way that is accessible to the public. It is easier to say this is bad than explain why this is good, especially when the technology is so elevated. I would really challenge all of you to think about how you discuss your findings with the public so that we can advance this beyond regulation and all the discussion but actually have a conversation with consumers.

Senator BOOZMAN. [Presiding.] Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

The availability, the affordability, and the quality of our food, though often taken for granted, is a linchpin of every American's personal security. There is a tremendous amount of interest in what is in our food and how it is produced and, specifically, genetically engineered plants and the food that is produced them.

I want to thank Chairman Roberts for holding this hearing because I do think it is important for the American public to understand what is being done to ensure the safety of the food that Americans eat. I also think it is important to hear about how fundamental biotech ag products are to our ability as a nation to provide for our food security.

I have been working with our Chairman, Chairman Roberts, and with the Ranking Member, Senator Stabenow, on putting together bipartisan consensus legislation to address the issue of labeling of

food made with genetically engineered, or GMO, products. I have had a lot of good conversation with my colleagues on both sides of the aisle and I am hoping that today's hearing can further those discussions.

So, with that in mind, my first question for each of you is, from a scientific perspective, is there anything that makes genetically engineered crops less safe for humans or the environment than traditional plant breeding techniques, such as cross-breeding? Mr. Gregoire, if you would start.

Mr. GREGOIRE. Yes. We have not found that to be the case with any of the products that have gone through our regulatory system, and we have confidence in the safety of the GE plants that we have approved.

Senator HOEVEN. Mr. Jordan.

Mr. JORDAN. For EPA, the products that we have looked at are safe. They pose no greater risks than the conventional crops that are not genetically engineered.

Senator HOEVEN. Dr. Mayne.

Ms. MAYNE. Similarly, the products that have been through our consultation process, we have determined are as safe as the conventional counterparts.

Senator HOEVEN. A second question would be how can your agencies better communicate the safety of products that you have vetted? How can you better communicate? Mr. Gregoire.

Mr. GREGOIRE. I mentioned some of the things we do, and that is to be transparent in our decision making and share the analyses that inform the regulatory decisions that we make. I think the undertaking that is the review of the Coordinated Framework will help with this, as well, because one of the objectives there is to make the system more clear, transparent, and understandable for both the public and for developers.

Senator HOEVEN. Mr. Jordan.

Mr. JORDAN. We at EPA are doing many of the same things that Mr. Gregoire mentioned, making our decisions and the basis for them public, giving the public lots of opportunities to engage us if they either do not understand or disagree, and we always respond to the comments. We will use the Coordinated Framework to revisit our activities and see if we can do a better job.

Senator HOEVEN. Dr. Mayne.

Ms. MAYNE. I would say the same, that as part of the Coordinated Framework, we should make it a deliverable to try to figure out how we can better enhance communication around this complicated topic. Having the involvement of external review from the National Academies may be helpful to us in that regard.

Senator HOEVEN. What recommendations would you have, if any, for food labeling in regard to GMOs? Mr. Gregoire.

Mr. GREGOIRE. So, the labeling belongs with our colleagues in the Food and Drug Administration. We do recognize that having a multitude of disparate laws and statutes among the different states and local governments can be confusing to consumers, and developers and food companies and the USDA wants to be helpful in this process.

Senator HOEVEN. Mr. Jordan.

Mr. JORDAN. EPA has no authority or responsibility for food labeling and our agency has not taken a position on that issue.

Senator HOEVEN. Dr. Mayne.

Ms. MAYNE. From an FDA perspective, our goal is to make sure that the labeling is truthful and not misleading, and that is our goal. As we indicated previously, we have issued voluntary guidance as to how manufacturers can label their foods with regard to either the presence or absence of ingredients from genetically engineered products.

Senator HOEVEN. Do you have any other recommendations?

Ms. MAYNE. Truthful and not misleading.

Senator HOEVEN. Okay. Thank you.

Thank you, Mr. Chairman.

Chairman ROBERTS. [Presiding.] Senator Bennet.

Senator BENNET. Thank you, Mr. Chairman. Thank you for holding this important hearing, and it is good to try to establish a shared understanding of the facts, and I think that is a very important place to start. For all the reasons Senator Thune said, this has been very important to the West and to Colorado, to increase the yields of some of our most important crops like corn and sugar beets.

This is for you, Mr. Gregoire. However, I have heard concerns that biotech crops can sometimes accidentally mix with non-GMO crops in neighboring fields. This includes organics, which consumers expect to meet very specific standards. How is APHIS working to avoid contamination—working with our farmers to avoid contamination of non-GMO crops and develop best practices for growing all types of crops?

Mr. GREGOIRE. Thank you for that question, Senator. So, there are two aspects of this. While GE crops are under regulation, and in field trials our regulations are designed to keep them confined and so that this problem does not occur, I think the greater issue is once we have deregulated and the products have become commercialized that we see these issues of gene drift and so on.

The Secretary has recognized this is an important issue for our stakeholders. Our policy in USDA is that we support all forms of agricultural production, be it conventional, biotech, or GE. That should be the farmers' choice with what they grow.

Given that, the Secretary and the Department have undertaken a number of measures, working with stakeholders to identify ways that we can strengthen coexistence among the different agricultural production systems. APHIS and other USDA agencies have been part of that effort, and so we have announced things in USDA, like additional research to prevent gene flow, for example, looking at crop insurance programs, looking at best management practices that we can share with producers to mitigate these kinds of issues. So, it is not just APHIS, but the Secretary is using the resources throughout USDA to address this issue.

Senator BENNET. How big a risk do you think it currently is? Is it a risk that is growing, and are the recommendations that you are making actually getting out to the country, or is this still internal in the bureaucracy of the agency?

Mr. GREGOIRE. No, much of this has already been shared. We are still in discussions with stakeholders about additional measures

that the Department can take to strengthen coexistence. There are a lot of measures that the industry has undertaken themselves to deal with these issues, as well.

Senator BENNET. Dr. Mayne, every year, as you have testified here, more GMOs successfully move through the FDA's food safety review process. While the studies that have been cited today have concluded that GMOs are safe, some of my constituents have concerns about the changing landscape of biotechnology, evolution of biotechnology, especially when the FDA does not conduct its own tests of the GMO foods. In your view, are the current practices for evaluating GMO foods at the FDA keeping pace with innovation in biotechnology, and how are you thinking about that coming challenge?

Ms. MAYNE. So, I would say, at this point, yes, we are keeping pace with changes in biotechnology, and one of the things we will be looking at as part of the Coordinated Framework is more horizon scanning. What do we need to do in the future, and what types of challenges might we anticipate coming at us in the future and how do we best prepare to deal with those challenges. So, that will be one of the things we will be looking at.

Senator BENNET. I am just—as you—what was that term you used, horizon scanning?

Ms. MAYNE. Horizon scanning, yes.

Senator BENNET. So, as you think about the coordination the White House has asked you to do, maybe I will close just by asking each of you what you think that interagency work—what kind of horizon scanning that is going to make possible beyond the question that I just asked Dr. Mayne. What are some things that are going to be at the forefront of the discussion you have?

Mr. JORDAN. Senator, I think that there are a couple of things that have already begun. First and most important is conversations between the regulatory agencies—FDA, USDA, and EPA—and parts of the executive branch engaged in research that includes work with new breeding technologies. As the researchers discover what they can get done, knowing about that as a regulator is helpful to us because it helps us both prepare for eventual commercial products and also give feedback to the researchers if there is an issue that they might encounter once those products become subject to the regulatory process.

Senator BENNET. Thank you, Mr. Chairman.

Chairman ROBERTS. Senator Ernst, and Senator, I understand that Iowa Public Television is covering this event, and I know that you will be at your best.

Senator ERNST. It is wonderful. Thank you very much, Mr. Chair. I appreciate that.

Well, thank you, folks, for joining us here today in this committee hearing. I just came from the Armed Services Committee, and, of course, we focus very much on national security, and Senator, I believe you mentioned national security and food security in your opening statement, so, thank you for doing that.

The Director of National Intelligence, DNI, released a report last week pointing out the national security threats posed by global food insecurity. If we fail to embrace biotechnology as a safe, affordable, and timely way to bring better food production methods

to developing and unstable nations, we are ultimately putting our military and our country at greater risk. How can this administration and your agency specifically work to help the public better understand the science supporting biotechnology so we can better address the national security challenges laid out by DNI? I would open that up to our entire first panel.

Mr. GREGOIRE. Well, I have mentioned some things that we are already doing in terms of being transparent in our decision making, and the Coordinated Framework review that we have undertaken is, at least in part, designed to get at this issue. Beyond that, I think we just need to really redouble our efforts to communicate better about our processes and the science behind them.

Senator ERNST. Thank you.

Mr. JORDAN. Government needs to speak clearly, to answer questions responsibly, to lay out fully all of the information that we have, and I hope and expect that anyone who gives that fair consideration will conclude, as we have, that our decisions are protecting public health, the environment, and the food is safe.

Senator ERNST. Okay. Thank you, Mr. Jordan.

Dr. Mayne.

Ms. MAYNE. I would say just to continue to educate as best we can, using plain language techniques as best we can to communicate what the science really indicates with regard to the processes and how we review these commodities for safety.

Senator ERNST. Well, I appreciate that. I do think that—and many of us use this phrase in our own home communities, but—since many of us are from agricultural areas, but we do feed and fuel the world, and I do believe that that is very important to maintain stability around the globe and making sure that populations are fed. So, I appreciate your answers today. But, it is something that we need to continue working on. I believe that GMOs are safe. I believe we should have them available to the globe, so thank you very much. We appreciate it.

Chairman ROBERTS. Senator Klobuchar.

Senator KLOBUCHAR. I think I am going to defer to Senator Casey. He has another commitment. Then I will go after that.

Chairman ROBERTS. Senator Klobuchar has yielded to Senator Casey. Senator Casey is recognized.

Senator CASEY. I want to thank Senator Klobuchar, and I will be brief, so whatever time I have used, I will double that and give it back to her on another day.

[Laughter.]

Senator CASEY. So, thanks very much, and I will be brief, Mr. Chairman. I have to run, and we are all going in different directions for hearings and meetings. So, I will only pose one question. It will be for the whole panel.

But, let's start by talking about a number which I think stares a lot of us in the face. Some of us had mentioned, as Senator Ernst did, national security. Here is a number which I think—I will call it the 34 percent/70 percent number. According to the Food and Agriculture Organization of the United Nations in an October 2009 paper entitled, "How to Feed the World in 2050," they conclude that by 2050, the world's population will reach 9.1 billion, which is 34 percent higher than today. That is the 34 percent number. In

order to feed this larger population, food production must increase by 70 percent. So, if those numbers are correct, we have a major challenge we confront.

So, I guess, one of the basic questions I would ask is in light of the fact that all three of you represent part of the executive branch, and of July of this year, the Executive Office of the President issued a memorandum, as others have referred to, directing three organizations which have the primary regulatory responsibility for this area, meaning biotechnology. The Executive Order asked that an update of the Coordinated Framework for the Regulation of Biotechnology be undertaken.

I would ask you, in succession, and maybe we can start left to right, what is the current status of this work, and are there areas where both—or, I should say, all three, APHIS, EPA, and FDA, can increase collaboration? Maybe we will start on my left. I am sorry. We will start with APHIS.

Mr. GREGOIRE. Yes. Well, the review has just gotten underway and there are three focus areas. One is to clarify the roles and the responsibilities of the respective agencies. The second is to take a strategic look at how we can prepare for the future products of biotechnology. The third is to get an outside expert study of the future landscape of the products of biotechnology.

So, there is work that has gotten underway in each of those three areas. APHIS is cooperating fully. We have put some of our best scientific staff on this work. FDA is hosting a public meeting later this month. APHIS anticipates hosting one of the future meetings after this first one.

Senator CASEY. Okay. Mr. Jordan.

Mr. JORDAN. There will be three public meetings, and EPA gets the third one, so that each of us will actively reach out to stakeholder communities and draw them into this conversation about how to improve coordination, improve clarity and transparency.

One thing that the July memorandum accomplished that no one has spoken to yet is the creation of a formal coordination mechanism, a committee, and it is a mouthful. It is the Emerging Technology Interagency Policy Coordination Committee. But, it gives us a formal opportunity, a regularly scheduled place to bring our issues together and talk about them. We already do have such conversations among our staffs at FDA and USDA and EPA, but making this more formal, I think, will be a good thing.

Senator CASEY. Thank you.

Doctor, if you could limit it to 30 seconds. Sorry about that.

Ms. MAYNE. Well, I echo what they said. We are putting together formal mechanisms to get together on a regular basis, which had already been happening, but now we have a clear mandate on tasks that we should be thinking about. As you heard, FDA is preparing for a public meeting which will be held October 30. So, we are engaged in a process to get public comment on things that we should be considering as the three key agencies responsible here.

Senator CASEY. That is great. Thanks for being so brief.

Mr. Chairman, before I relinquish the microphone, on the second panel that I may or may not be back for, I want to make sure that I highlight one of our witnesses, do a quick bio here for Mr. Daryl Thomas. He is a Pennsylvanian, of course, He started his career at

Herr Foods as a salesperson. He served in both the Navy and the Army National Guard. His first job, I believe, at Herr's was to manage their quality assurance program. After getting a Bachelor's degree, he got a Master's of Science degree in food marketing from St. Joe's, a great university where my daughter attended some years after Daryl did.

Daryl serves now as Herr's Senior Vice President of Sales and Marketing. He is married to his wife, Martha. They have three sons, Daryl, Jeremiah, and Hans, and Hans, I am told, is married to Daryl's daughter-in-law Emily. They reside in Southern Lancaster County.

Thank you for letting me introduce him quickly. Not bad.

Chairman ROBERTS. Well, thank you, Senator Casey. That means that I will not have to read that again.

[Laughter.]

Chairman ROBERTS. But I will if you want me to.

Senator CASEY. I will come back and read it if I can.

Chairman ROBERTS. All right, that is fine. Thank you so much.

Senator Tillis.

Senator TILLIS. Thank you, Mr. Chair. I want to thank all of the panelists for being here.

I know that this question may have been asked in a different way, but I tell you, back in North Carolina, there are a lot of misconceptions about biotechnology and the safety of the food supply. So, if you are sitting at a diner or a barbecue joint in North Carolina and somebody asks you a question about biotechnology-driven breeding techniques versus other ones, what would you tell them? Are they any more or less safe? I will start down the line with Ms. Mayne.

Ms. MAYNE. As I have said, they are as safe. It is——

Senator TILLIS. As safe.

Ms. MAYNE. It is a different way to accomplish incorporating desirable genes into plants.

Senator TILLIS. But, in your opinion, there is no science to suggest that they are any less safe?

Ms. MAYNE. That is our opinion, any less safe than their conventional counterparts.

Senator TILLIS. Mr. Jordan, what would you tell the person at that diner table?

Ms. MAYNE. Senator, I would say we have looked at these products six weeks to Wednesday and we are convinced, and so, too, are outside experts, that these things are safe.

Senator TILLIS. Mr. Gregoire.

Mr. GREGOIRE. I would just emphasize the very thorough review that they get by the U.S. Government agencies before they are commercialized.

Senator TILLIS. So, we have senior people from three very important agencies, FDA, EPA, and USDA, all saying that the science suggests this is safe and that while we always want to scan the horizon, as Ms. Mayne said, till it for any other potential threats, there is no evidence to suggest that the crops that we have in the field today, the techniques that we are using for breeding, are in any way unsafe and a threat to our food supply.

I have another question. This may be an unfair question for you, Mr. Gregoire, but I do want to get it out there so that we can research it. Let us say we roll back the clocks. Some believe that all of these techniques are bad and that we should basically eliminate them. Has there been any research done to determine what that would look like in terms of the impact on our production or our food supply today? So, roll back the clock. Get rid of all the gains that we have made in terms of agriculture output. Let's go back to a pre-biotech era to get some idea of what that would really mean to our food supply.

I know, for example, in Iowa, about 95 percent of the corn grown there is a product of biotechnology. If we really look back—I think that there are really some who would think that would be a good idea—I am just trying to get an idea of how that would affect us.

Mr. GREGOIRE. I do not know if that question has been put to us in that particular way. I can tell you, though, that biotech crops have been widely adopted by producers in the U.S. Upwards of 90 percent now of corn, cotton, soybeans, and sugar beets are now genetically engineered. So, had that not been the case—I think we probably have some reports and statistics that we might be able to share with the committee from the Economic Research Service in USDA that might be helpful to provide for the record.

Senator TILLIS. I guess there are some that say the baseline regulations our agencies are using to oversee biotech and breeding techniques have not really been updated since the 1980s. Are they broken and do we need to fix them, or are they sufficient for you all to do your respective jobs? Dr. Mayne, we will start with you.

Ms. MAYNE. I feel they are sufficient for us to do our current jobs.

Senator TILLIS. Mr. Jordan.

Mr. JORDAN. EPA administers two laws. We think they work very well.

Senator TILLIS. Mr. Gregoire.

Mr. GREGOIRE. I believe that our regulatory system in APHIS has served the country very well in terms of protecting plant health. We are pursuing updating our regulations so that we are in a good position in the future, going forward. We have got many years of experience now. We would like to apply the lessons learned over these many years of regulation and also, account for the new science and the technology.

Senator TILLIS. Well, the flip side of that question would be, if it does not look like we need any more or new regulations or processes put into place, what, in your opinion, could we do based on our knowledge of the science to stream for regulators? There was a lot less certainty in the 1980s than there is today based on the science that has been developed over that period of time. Are there things that we could do to actually ease the regulatory burden and potentially make the processes that people have to go through for approval more efficient, less burdensome, and more likely that we are increasing productivity and producing better outcomes for agriculture?

Mr. GREGOIRE. Two points on that, Senator. One is that we have made a real effort in APHIS over the last three years to improve the timeliness of our regulatory decisions. We appreciate that Con-

gress has provided additional resources for our program to do that. We have pretty much eliminated the backlog in petitions that we are dealing with and we have reduced the time frame that had gotten up to more than three years, on average, down to about 18 months, and I think we can get it down to about 15 months.

As we start talking about a new regulatory system, or an updated regulatory system, those are the kind of questions that we will be looking at and talking to stakeholders about, as well.

Senator TILLIS. Thank you, and thank you, Mr. Chair.

Chairman ROBERTS. Senator Tillis, are you not going to ask Mr. Jordan the same question? I mean, he does come from the EPA.

Senator TILLIS. Well, I just wanted to make sure that the Marine Chairman would be okay for me going into overtime, but I would like to ask that question of Mr. Jordan and Dr. Mayne, if I may.

Chairman ROBERTS. I am very interested in their response.

Senator TILLIS. Thank you.

Mr. JORDAN. Thank you, Senator. Congress has passed an amendment to the Federal Insecticide, Fungicide, and Rodenticide Act referred to as the Pesticide Registration Improvement Act, PRIA. Everything has an acronym. It sets deadlines for EPA to review and make decisions on applications for all sorts of pesticides, including PIPs. Our deadline for PIPs varies, depending on the type of product, from 12 to 18 months, and it provides us resources to do that. That is on the same timeline as USDA's reviews are now taking place and the FDA reviews. So, we are able to align our review schedules with those of other agencies, share information, and that is an efficiency for the companies as well as for the agencies.

Ms. MAYNE. Just quickly, I would say that from an FDA perspective, the fact that our process is voluntary but has worked very well is an efficient way for us to enforce the Act.

Senator TILLIS. Thank you, Mr. Chair.

Chairman ROBERTS. Senator Klobuchar will be recognized next, but Mr. Jordan, the Department of Labor is in the business now of issuing regulations on the pesticide application process to many farmers and ranchers and that has caused quite a fuss. Are you working with the Department of Labor folks? I am very hopeful the answer is, yes, in a positive way, with the question raised by Senator Tillis on regulations that we feel are not necessary and are very burdensome.

Mr. JORDAN. Senator, the Department of Labor and EPA do work together on safety when it comes to pesticide issues. Yes, we are looking for streamlined and streamlining regulatory processes and avoiding undue burdens.

Chairman ROBERTS. Well, in that arm wrestling contest, I hope that you speak up loud and clear.

Dr. Mayne, do you have any comment about that?

Ms. MAYNE. No specific comment on that.

Chairman ROBERTS. Senator Klobuchar.

Senator KLOBUCHAR. Thank you very much, Mr. Chairman.

Dr. Mayne, you just mentioned the FDA pre-market approval process and the voluntary process. Do you think there is anything—as we look at—and I know a lot of the White House effort on coordinating and making sure things are not falling through the

cracks is about safety, but it is about consumer confidence, as well. Do you think there should be any statutory changes to that process or do you think it works?

Ms. MAYNE. I mean, as I indicated, it is a voluntary process. We do believe it has worked well. We are unaware of any product that has come into the U.S. market, been commercialized, that has not gone through the voluntary process. There are many incentives for a developer to go through the process. So, our experience is that it has been working well.

Senator KLOBUCHAR. Okay. Senator Casey asked all of you about the Coordinated Framework among the agencies that are represented here today, and you answered the process questions about what was happening. Are there any preliminary results that have come out of that which you could share with us? Mr. Gregoire.

Mr. GREGOIRE. You are referring to the coordinated review?

Senator KLOBUCHAR. Yes.

Mr. GREGOIRE. No, it has really just gotten underway——

Senator KLOBUCHAR. Yes.

Mr. GREGOIRE. —so it is a little too early to say.

Senator KLOBUCHAR. Okay. Do you know when we will have some preliminary results?

Mr. JORDAN. The different agencies are pressing ahead quickly. As we mentioned, there is a public meeting on October 30. There is also a Federal Register notice inviting the public to comment both on how to update the Coordinated Framework and ideas for consideration as part of the long-range strategies that our three agencies are working on. We are aiming to pull that information together and have something fairly early next year, but it will probably be an updated version of the public—of the Coordinated Framework for public comment.

Senator KLOBUCHAR. Okay. Mr. Gregoire, I know you were asked—all of you have been asked about the advances in biotech research in the last ten years and how your own processes have evolved with new products coming in. Since biotech crop varieties first became commercially available in the mid-1990s, APHIS has approved more than 14,000 field trials of plants, it is my understanding. How has your division evolved in order to handle the workload, and can you comment on some of the challenges you faced with the development of the new crops.

Mr. GREGOIRE. Well, the program has certainly grown and Congress has increased the funding for our biotechnology regulatory services program rather substantially a few years ago. We feel like we have the resources we need to do the job, to provide the regulatory oversight and to make our decisions in a timely sort of a way. So, the workload and staffing has been a challenge, but I think we have met that challenge, and keeping up with the science, and our scientists, like the scientists from the other agencies, do a lot to keep abreast of the changes in plant breeding technology and so on. So, that is a very important sort of thing, too.

Senator KLOBUCHAR. Okay. My state, as you know, is the nation's fifth largest agriculture producing state, about 79,000 farms. I think you also know agriculture is cyclical in nature and producers face natural and market challenges. Your agency helps producers deploy farm management practices, which have been in-

creasingly sophisticated over the years. Can you comment on if and how you have seen biotech develop in that context of farm management.

Mr. GREGOIRE. Well, it is certainly a technology that has been widely adopted. Our role is not so much an extension kind of a role, working with individual producers on this. We review the products for the safety for plant health and that is generally the procedure that all the developers go through before it is widely commercialized. We have, as the Department and USDA, shared information on best practices for things like weed management and coexistence and so on.

Senator KLOBUCHAR. All right. Thank you.

Chairman ROBERTS. The Chair recognizes no stranger to the Iowa Public Television audience, the distinguished Senator, Senator Grassley.

Senator GRASSLEY. Well, after a comment like that, I am going to have to thank you for holding this very, very, very important hearing. I think it is important that we do review regulation from time to time to ensure that our policies and regulations are functioning.

Biotechnology holds great promise for agriculture, and as the population grows around the world, and it is going to continue to grow very dramatically, food security will become a more important issue for—and a very critical issue for people around the world. Biotechnology will help us continue to meet future requirements, and I was glad to read what Director Mayne said in her testimony. The science says that there is no difference between foods derived from plants that utilize biotechnology in foods.

I also often run into this issue of safety or what consumers want to eat when European parliamentarians come around to our job, and you know how farmers around the country are. It is a very imprecise test of when a grain is ready to harvest, but sometimes you take a bean or a kernel of corn and put it between your teeth and see if it is ready to harvest. I always tell them I have been doing this for 20 years and I am alive. I am a living laboratory for the safety of biotechnology.

[Laughter.]

Senator GRASSLEY. I have one question of the panel, but I would like the three of you to do it. You may think I am asking this question that I expect you to know about the regulatory process in other countries. That is not what my question is about. It is about what other countries do, and it comes from the fact that China rejected several shipments of dried distiller grain because of an unapproved biotech trait that they said was present. This caused disruption in the grain trade that is still being sorted through by lawyers.

From a scientific standpoint, I would like to have each of you tell me how sensitive is testing for GMO traits by other countries that they can find traces of GMO traits on a large ocean-going vessel.

Mr. GREGOIRE. I do not know if I could put a number to it, Senator, other than to say there are very sensitive tests that are available to detect even trace amounts of a product in a large shipment.

Senator GRASSLEY. Okay.

Mr. GREGOIRE. We certainly recognize and are focused on the issues of trade with China. The Secretary has personally done a lot

in this realm. There was a recent bilateral between the U.S. and China. That was during President Xi's visit. Both sides committed to further improving the biotech approval process and reaffirmed the importance of a timely, transparent, predictable, and science-based approval for biotech products. The Foreign Agricultural Service in USDA is very focused on these kinds of issues and APHIS plays a supporting role to them to try to address these issues and trade disruptions.

Senator GRASSLEY. Mr. Jordan, will you respond, please, and then Dr. Mayne.

Mr. JORDAN. Certainly. With regard to the sensitivity of analytical methods, my understanding is, like Mr. Gregoire's, that the methods are very sensitive and capable of detecting very low level presence of genetically engineered traits in large shipments. I am sure many others are aware, we recognize that when we have approved something here in the United States and it then goes to a country where it is not approved, that which could be the source of trade problems. That is why we at EPA work with our colleagues at the Foreign Agricultural Service and USDA to provide information about our regulatory decisions to other governments. That is why we participate in international organizations to develop worldwide standards that would ensure consistent outcomes when different countries are looking at the same kinds of products.

Senator GRASSLEY. Dr. Mayne.

Ms. MAYNE. From a food safety point of view, I would say we do engage in a dialogue with other countries, including China. We similarly had a meeting with some of the high-level Chinese food safety experts just recently.

The other thing I will reiterate is the food safety approaches we use are consistent with the CODEX international guidelines. So, we are adhering to international standards when we consider how we review the safety of these commodities.

Senator GRASSLEY. Okay. Thank you, Mr. Chairman.

Chairman ROBERTS. Thank you, Senator Grassley.

Dr. Mayne, when you are working with China, are you getting the static that they are putting up about that one shipment? I hope it is just one, but it could be more. I understand the shipment was turned away in China, but it did sell the product to another country. So, that is an interesting thing. But, is this coming from your experience from the scientists involved that you work with, obviously, on a collaborative basis, or does this come from higher up? Where is the problem, as you see it?

Ms. MAYNE. I do not—I cannot comment on the specific problem. What I can say is we are engaged in a dialogue with Chinese officials about how to assure food safety, and that is a commitment we have broadly, not just with genetically engineered foods. But, we work with Chinese officials to try to assure a safe food supply.

Chairman ROBERTS. Tell them we have your back.

Senator Brown.

Senator BROWN. Thank you, Mr. Chairman.

I would like to ask a question of the whole panel, and I guess I will start with USDA, if I could. If Congress were to task each of your agencies, USDA and EPA and FDA, to task each of your agencies with developing a label, whether voluntary or mandatory,

what are some of the factors you would look at to ensure a label that is truthful and not misleading? If you would, just give us your thoughts on that.

Mr. GREGOIRE. Well, APHIS has really not had any involvement or experience with food labeling. That is in FDA's realm. I will say, though, that we hear from stakeholders about concerns they have with the potential proliferation of different laws and statutes that might be coming out from the different states and local governments. We would be happy, if the committee is going to be looking at the House bill, to provide technical assistance on looking at that bill with our scientific people and attorneys in USDA.

Senator BROWN. Mr. Jordan. Even though nor does EPA write the labels, but if you would give thoughts on the kind of input you would want to see result in a voluntary or mandatory label that is useful, not misleading, to consumers.

Mr. JORDAN. That is an area that I have not personally worked on, nor has my agency. My sense is that public perception and understanding of different types of labeling would be an important consideration as to how they would take particular words and whether they would form an impression that was inconsistent with the reality, so whether it was misleading in FDA's terms.

There would be issues about definition of what is a genetically engineered ingredient. Would a product from livestock that fed on grain sources that were genetically engineered, would the livestock products be covered? Some definitions of what constitutes genetically engineered materials would also be an important consideration.

Senator BROWN. Dr. Mayne.

Ms. MAYNE. So, FDA issued draft guidance in 2001 on how companies could voluntarily label products. We have examples in that draft guidance. We received over 155,000 comments on that draft guidance. So, we have received public input on how to get voluntary labels out through this process and we are hoping to finalize the final guidance before the end of the year.

Senator BROWN. Mr. Jordan, let me ask you a question, a bit unrelated. Farmers obviously face challenges in the field every year, expected, unexpected challenges. One challenge that has become concerning is weed and pest resistance. Does EPA consider weed and pest resistance during its risk analysis of FIFRA registered products, and how has consideration of resistance changed in the past three or four or several years?

Mr. JORDAN. Thank you, Senator. EPA does consider pest resistance, both weed resistance and insect resistance, as we make our regulatory decisions about pesticides. Over the last several years, I would say that we have changed our position. In the past, we relied on the marketplace and farmers and education programs directed at farmers to encourage them to follow the kinds of behaviors that would prevent resistance from arising or would slow its spread. In certain cases, we recognize that it has not worked as well as we had hoped and wanted, and so we have begun to work with the companies that register pesticides to get them to play a greater role and to look at more effective ways of getting growers to adopt practices that address pest resistance.

Senator BROWN. Thank you. Thank you, Mr. Chairman.

Chairman ROBERTS. Senator Gillibrand.

Senator GILLIBRAND. Thank you, Mr. Chairman. I appreciate this hearing.

Dr. Mayne, you said that you hope to issue the final guidance at the end of this year, is that correct?

Ms. MAYNE. That is correct.

Senator GILLIBRAND. Apart from the 150,000 comments you received, how is the FDA engaging with producers for this option?

Ms. MAYNE. With the industry?

Senator GILLIBRAND. Correct.

Ms. MAYNE. We have consulted with industry. Industry also has the ability to submit comments into the docket on any proposed thing that we put out there. So, industry is part of the dialogue.

Senator GILLIBRAND. Great. While all domestic producers who have brought GE crops to market have been through the voluntary FDA consultation process, I am not confident that this is always the case, particularly as foreign biotech companies expand. Has FDA worked with foreign companies that are interested in marketing their GE products in the U.S.?

Ms. MAYNE. We have. In fact, some of the more recent approvals have come in for other countries. For example, the Arctic apple was a Canadian company that we have worked with, and we have worked with companies from other countries, as well.

Senator GILLIBRAND. Do you think that the current FDA review process has sufficient time where we could continue to import a growing number of parts—a growing share of our food? What safeguards do you have in place so that you have an appropriate review process for GE products coming in? Do you have a way to scan the horizon and really do the oversight that you want to do?

Ms. MAYNE. So, with imports, obviously, if we are aware of a developer that is making a—or working on a new application in another country, we would encourage them to come into our process. So, we work with Foreign Agricultural Service and others to be aware of crops that would be being developed overseas.

But, the ultimate answer is that the importers have the same responsibility to assure that their foods are safe that are brought into the U.S. market as any other crop. So, we have our import authorities to ensure the safety of all foods, including any genetically engineered foods, coming from other countries.

Senator GILLIBRAND. Mr. Gregoire, the USDA draws its authority to regulate GE products from the Plant Protection Act, which obviously is concerned with potential plant pests. While some older genetic engineering tools relied on plant pest bacteria and viruses to modify the DNA, many newer tools do not. Does APHIS have sufficient authority to regulate GE crops that are developed with the new engineering editing tools?

Mr. GREGOIRE. Thank you, Senator. We do. We do have sufficient authority. I do not think there are any gaps in our ability to deal with risks to animal and plant health. The Plant Protection Act gives us a very, very broad authority in this area. Again, just as a core principle, the coordinated framework is the underpinning of our regulations; the focus is not so much on the method by which a plant is transformed but the product of the transformation and what risks that product might pose.

Senator GILLIBRAND. Can you explain whether a gene that is inserted into a plant with a gene gun is any more or less concern than one that is inserted by bacteria?

Mr. GREGOIRE. No, it is not. It really, again, goes to what trait is being put in what organism and how that would be put into the environment. Those are the things that we would really be focused on looking at.

Senator GILLIBRAND. Do you think you need any more refined authority to do that?

Mr. GREGOIRE. I do not think we need any more statutory authority to do that.

Senator GILLIBRAND. This question, I do not think because it is not your area of expertise, but I saw that the USDA announced a way for companies to receive a voluntary label from USDA certifying that their product is GE-free. For the record, if you do not know the answer, can you have someone describe the process to receive this label and how it differs from the organic label that is also provided by USDA. Also, what is the USDA doing to promote the new label and what effect do you think it will have on consumer choice? Are producers showing an interest in this new label?

Mr. GREGOIRE. Those programs are run by the Agricultural Marketing Service. That is one of our sister agencies, and I think it would be best if we just responded to——

Senator GILLIBRAND. That would be great.

Mr. GREGOIRE. —to that question for the record.

Senator GILLIBRAND. That would be wonderful.

Mr. GREGOIRE. Thank you.

Senator GILLIBRAND. I just want to go back to Dr. Mayne for one second. At the end of your consultation process from producers, you issue a letter that says, no further questions, on your determination. How come you do not end that process with a letter that says your product is safe?

Ms. MAYNE. So, the consultation process is a service that we provide to industry to help assure that they are meeting their compliance obligations to have a safe food. It is voluntary, and to date, it has worked well.

Senator GILLIBRAND. But, you do not make an assessment or whether it is safe?

Ms. MAYNE. Well, what we do is we consult on the safety. So, we consult as to whether or not we believe that anything has any antigenic or allergenic potential, any toxic potential. But it is ultimately industry's responsibility to assure the safety of that product. So, we consult with them on this.

Senator GILLIBRAND. Okay. So, you do not determine if it is safe. You just create a dialogue to make sure they are doing their job.

Ms. MAYNE. Well, correct. We review the science. We review the data to make sure that we have no further questions about the safety. If we were to have to attest to that safety specifically, then that would shift some of that burden to FDA——

Senator GILLIBRAND. To you.

Ms. MAYNE. —with obvious resource implications.

Senator GILLIBRAND. Got it. Thank you.

Thank you, Mr. Chairman.

Chairman ROBERTS. I think we now are going to move to the second panel. We thank the witnesses from the first panel. You have provided excellent testimony. You have shown a great deal of patience and we thank you very much.

We would ask the second panel to come forth and be seated, please.

[Pause.]

Chairman ROBERTS. Welcome to our second panel of witnesses before the committee this morning.

Joanna Lidback, a dairy producer from Vermont. Our foliage expert, Senator Leahy, introduced this witness. It is important for us to hear directly from farmers on the issue before the committee, and Joanna Lidback operates the Farm at Wheeler Mountain in Northeastern Vermont along with her husband, Adam. They milk Jerseys and Holsteins and manage a grass-based cropping and grazing program and run a Jersey beef direct sales business. Mrs. Lidback also works as a business consultant with a Farm Credit Association. Welcome. I look forward to your testimony.

In the interest of time, I am going to introduce all the witnesses.

Our second witness is Daryl Thomas. Senator Casey has already introduced this witness. Mr. Thomas is the Senior Vice President for Sales and Marketing from Herr Foods, Inc., from Pennsylvania.

I regret not introducing you twice, but in the interest of time, I would like to move to Gary Hirshberg, co-founder and Chairman of Stonyfield Farm from New Hampshire. Senator Stabenow is scheduled to introduce this witness, and I would refer to her at this point.

Senator STABENOW. We actually do not—I think you have the introduction, Mr. Chairman, if you would like to proceed.

Chairman ROBERTS. I would be delighted. Mr. Hirshberg is the co-founder and Chairman of Stonyfield Farm, an organic yogurt producer. He is here on behalf of Just Label It, a national campaign to label genetically engineered foods. Welcome and thank you for joining us.

Our fourth witness is Greg Jaffe, the Director of the Project on Biotechnology, Center for Science in the Public Interest, from Washington, DC Mr. Jaffe is the Director of the Project on Biotechnology at the Center for Science in the Public Interest, a nonprofit consumer organization. Previously, he served in the Department of Justice's Environmental and Natural Resources Division and with the EPA. I appreciate you sharing your testimony with us.

Mrs. Lidback.

Mrs. LIDBACK. Thank you. Chairman Roberts, Ranking Member Stabenow, and other members——

Chairman ROBERTS. Mrs. Lidback, I am sorry. I did not introduce Dr. Ronald Kleinman. We would not want to do that to the good Doctor.

I apologize. You are the Physician in Chief at the Massachusetts General Hospital for Children from Massachusetts. Dr. Kleinman is the Physician in Chief at the Massachusetts General Hospital for Children, the Chair of the Department of Pediatrics at the Massachusetts General Hospital, and the Charles Wilder Professor of Pediatrics at Harvard Medical School.

His major areas of interest include gastrointestinal immunology, nutrition support of infants and children, and nutrition and public health. We also look forward, sir, to your statement and experience.

Now, Mrs. Lidback, the Chair has corrected my egregious error and we look forward to your testimony.

STATEMENT OF JOANNA LIDBACK, PRODUCER, THE FARM AT WHEELER MOUNTAIN, WESTMORE, VERMONT, ON BEHALF OF AGRI–MARK DAIRY COOPERATIVE AND NATIONAL COUNCIL OF FARMER COOPERATIVES

Mrs. LIDBACK. Well, thank you again. Chairman Roberts, Ranking Member Stabenow, and other members of the committee, thank you for inviting me here to talk about agricultural biotechnology. I am testifying on behalf of Agri-Mark Dairy Cooperative and the National Council of Farmer Co-Ops.

I live with my husband and our two young boys on a 50-cow dairy in the beautiful Northeast Kingdom of Vermont. In addition to selling our milk to the co-op, we grow hay, raise Jersey steers to sell beef locally, and we market a small amount of composted manure. We farm about 200 acres of land, including 50 acres of pasture where we graze our herd.

My husband and I are both proud to be first-generation farmers. Starting out on our own to build a dairy operation has been trying at times, but all of the hard work we have endured could never outweigh the chance to raise our boys in a farming lifestyle, all the while producing food for our little corner of the world.

When we started building our operation, we knew that environmental and economic sustainability would be important in order to pass the farm along to our sons someday. We needed to diversify our operation and use modern technology at the same time to have a positive impact on our farm and our community. My husband always says, as a farmer and a small farmer at that, we have so much working against us, we need to make use of all the things that will work for us.

Biotech crops are essential to sustaining our dairy and keeping our feed prices affordable. To compare, a non-GMO basic feed would cost us $555 per ton and the same conventional feed that we currently purchase is $305 per ton. We purchase 16 tons of grain each month, and if you do the math, we would be paying an additional $4,000 a month, or $48,000 per year, for non-GMO feed. I do not see how we could profitably farm in the long term with those increased feed costs. I am certain our small farm would be pushed out of business.

Biotechnology is also a key to our stewardship of the land. One myth I have heard is that biotech crops increase pesticide use. My neighbors growing these crops would tell you that the truth is exactly the opposite. In fact, according to the USDA, overall pesticide usage in the U.S. peaked in 1982 and has been trending downward ever since.

I am disappointed that my home State of Vermont passed a mandatory GMO labeling law set to take effect next year. The main argument for passing this bill was this idea that consumers have a right to know what is in their food. In my opinion, the new label

would not better inform consumers, but instead, it would serve as a warning sign.

I find the law to be frustrating and full of contradictions. For example, it applies to packaged and processed foods, but not if they contain meat. So, a can of vegetable soup would carry a label, but that same soup with added meat would not. Restaurant food is exempt. So, a frozen pizza from the grocery store might carry a label, but not a restaurant delivery pizza. At this time, dairy is also exempt, but my worry is that, over time, these odd exclusions would fall away.

I believe there are better uses of the state's time and taxpayer resources than imposing regulations on a technology that has been proven safe time and time again. I am also concerned about the impact this law will have on the cost and availability of food in Vermont's grocery stores and whether or not food companies will decide to simply not ship to the state because of the law's nonsensical labeling requirements.

With mandatory GMO labels, the cost of food at the grocery store will go up. A study out of Cornell University estimates an increase of about $500 per family of four per year. That may not seem like a lot to us in the room today, but the burden of this increase would be felt by those who could least afford it, including people in my own community. Eighty percent of the children in our local elementary school qualify for free or reduced price lunch already. These are the families who would be hardest hit for no good reason.

If a small percent of consumers are to drive a GMO labeling requirement, I believe it should be done in a voluntary and cohesive way at the federal level. Again, I do not believe those consumers, who can least afford it, should have to bear the burden for such a small percent of consumers that are pushing for mandatory labeling.

We know more now about growing food and caring for animals than we ever have and this helps us achieve a level of productivity that previous generations of farmers would envy. I am proud of how far the American farmer has come, just as I am proud of how far we have come on our own farm. I look forward to the day when our boys are grown and tell us they are ready to take over the farm. I know they will carry the values my husband and I have instilled in them, to be good stewards of the land, animals, and community, and I hope they still have the ability to use the latest tools and technology to help them do so.

Thank you.

[The prepared statement of Mrs. Lidback can be found on page 87 in the appendix.]

Chairman ROBERTS. We thank you for your testimony, Mrs. Lidback.

Mr. Thomas.

STATEMENT OF DARYL E. THOMAS, SENIOR VICE PRESIDENT OF SALES AND MARKETING, HERR FOODS, INC., NOTTINGHAM, PENNSYLVANIA

Mr. THOMAS. I, too, would like to thank this committee, Chairman Roberts, and Ranking Member Stabenow for holding this hearing. I greatly appreciate the opportunity to be here.

My name is Daryl Thomas and I am with Herr Foods. Herr's is a family-owned snack food company that was started in 1946 by my father-in-law. Our corporate headquarters are located in Pennsylvania and we operate two manufacturing facilities and 22 warehouses throughout the Northeast.

The regulation of foods derived from biotechnology is an important issue facing our industry today, especially since the State of Vermont recently approved the nation's first mandatory GMO labeling law. Absent a federal solution, by July 2016, when Vermont's law takes effect, manufacturers will have three options to comply. The first is to redesign packaging. Second is to reformulate products so that no label is required. Or, three, halt sales to that state.

While we have not made a final decision, we are considering several factors that will make it difficult to continue sales in Vermont. One factor is the ability of our distribution chain to segregate products for Vermont, since it is the food manufacturer who is liable if mislabeled products make it onto store shelves. We recently received a note from one of the largest grocery wholesalers in the nation. The letter informed us that they will not take additional steps to segregate or otherwise specifically direct a shipment of Vermont-only products into Vermont.

Discussions about mandatory GMO labeling laws reducing consumers' choices are becoming much less theoretical and much more real. If the number of products on store shelves decreases, not only will consumers lose choices, but the lack of choice and competition could drive up cost. For some households, that might be easy to absorb. For others, it could be significantly more difficult.

You might wonder, so, why does not Herr's just change all of our ingredients to be non-GMO or at least change the ingredients in Vermont? It sounds simple, but it would actually be very difficult. The first problem would be sourcing the ingredients. Soybeans, cotton, and corn are three top ingredients used by manufacturing companies such as Herr's, and more than 80 percent of these crops grown in the U.S. are genetically modified. As a mid-sized company, it would be difficult to compete for the limited supplies of these ingredients.

There is also the issue of food product verification. In today's environment of increased litigation, we would want a third-party verification when we label a product as non-GMO. At Herr's, we use third-party certification for our non-GMO popcorn product, and in addition to the cost, the process took approximately six months. To do this for all 411 of our products would be both time and cost prohibitive.

The fact that states seem to be considering different standards for what is deemed genetically modified for labeling purposes only compounds this problem. For individual states to define the term GMO, set labeling protocol, and legislate fines for noncompliance, our food distribution system could be crippled. Segregation of non-GMO products from some states and GMO-containing products for the rest of the country would be even more difficult.

Just the additional cost of different packaging for one state versus another would be virtually insurmountable. To change the label on a bag can cost up to $5,500 per product. To do this for our

entire product line would cost Herr's more than $2.2 million for every state with a different law. That is a cost our family-owned business simply cannot afford. Mandatory labels are unnecessary to provide consumer choice. For those consumers who do not want GMO products, there are already voluntary labeled products available to them in the form of organic foods and non-GMO certified foods. We support giving consumers transparency and choice, but transparency should not be defined by different states.

The second question I considered in preparation for today is why does Herr's not just label all products as GMO if we cannot change—if non-GMO if we cannot—or as GMO if we cannot change our ingredients? My answer is simple. Mandatory labels on food products are reserved for critical information about nutrition and safety. GMO ingredients do not change the nutritional profile or safety of our products.

While it might not be the intent of mandatory GMO labels to imply inferior food or safety or nutrition, some groups have made unfound negative claims about genetically modified crops. The fact is that we have the safest, most abundant, and most affordable food supply in the world. I fear that a mandatory GMO label could be used by some to unfairly question the safety of our products.

Let me be clear. I am not here to testify about the safety of GMOs. That has already been confirmed by the FDA. I am here to advocate for a federal solution to a critical issue that could force hundreds of family-owned companies like ourselves to make distribution decisions that would negatively impact the sales, jobs, and food choices.

In conclusion, Herr's is extremely concerned about mandatory labeling for products containing GMO. We urge the Senate to pass a national set voluntary standard before the law in Vermont can take effect.

Again, thank you for the time to be here and I look forward to answering your questions.

[The prepared statement of Mr. Thomas can be found on page 111 in the appendix.]

Chairman ROBERTS. Thank you, Mr. Thomas.

Mr. Hirshberg.

STATEMENT OF GARY HIRSHBERG, CHAIRMAN AND CO-FOUNDER, STONYFIELD FARM INC., CONCORD, NEW HAMPSHIRE, ON BEHALF OF JUST LABEL IT

Mr. HIRSHBERG. Thank you, Chairman Roberts and Ranking Member Stabenow, for the opportunity to testify today. My name is Gary Hirshberg. I am the co-founder, Chairman, and former 30-year CEO of Stonyfield Farm. I also serve or have served as a director and advisor for numerous conventional and organic food companies now owned by firms such as Coca-Cola, Hormel, and General Mills, among others.

Today, however, I am appearing as Chairman of Just Label It, a coalition of more than 700 businesses and organizations dedicated to a mandatory disclosure system for products containing genetically modified organisms, or GMOs.

I have seen firsthand a remarkable and encouraging shift in consumer interest in food in the last 20 years. Consumers, especially

millennials, are demanding transparency as never before. Consumer interest in food and farming is a trend that should be welcomed, because our food choices have enormous impact on our health and on the health of our environment.

Grown in demand for sustainably-grown food is also good for agriculture, because two decades of double-digit annual growth in these categories is creating billions of dollars of new revenue, creating millions of jobs, and creating new opportunities for farmers, especially younger farmers.

When I started Stonyfield, most consumers had no idea what organic meant. Now, annual organic sales are nearing $40 billion, and most of the nation's largest food manufacturers are actively engaged in this category.

Our position is simple. Consumers have the right to know what is in their food and how it is grown, the same right held by citizens in 64 other nations. Recent polling and consumer data tell us that nine out of ten Americans, regardless of age, income, race, or party affiliation, want the right to know whether the food they eat and purchase for their families contains GMOs. Consumers give many reasons for wanting these disclosures, but chief among them is the extent to which GMO crops have increased the use of herbicides linked to serious health problems.

Let me be very, very clear. We strongly support a national GMO disclosure system that provides factual information. We do not support a warning or a disclosure system that renders a judgment on GMOs, and we are certainly not seeking a ban on GMO crops. Rather, we support a value-neutral disclosure that respects the rights of consumers to make their own choices.

Actual experience shows that food prices have not increased in the 64 nations that have adopted GMO labels, nor do consumers in these countries view GMO disclosures as warnings. At the same time that GMO disclosures have been adopted around the globe, GMO crop acreage has steadily increased, from 27 million acres in 1997, when the first GMO label was introduced, to 448 million acres in 2014.

The world's second-largest producer of GMO crops, Brazil, implemented mandatory labeling in 2003, yet less than one percent of food sales in Brazil are organic, and Brazilians have accepted GMO foods in the marketplace. Claims that a mandatory disclosure would disrupt GMO expansion were disproved by actual marketplace experience.

I know from my own experience that food companies change our labels all the time to highlight new innovations and that food companies and farmers already segregate GMO and conventional ingredients to serve our markets at home and abroad.

I also know from experience that a value-neutral disclosure will not cause sudden shifts in consumer behavior. In fact, a recent five-year study of consumer data confirmed that American consumers will not view a GMO disclosure as a warning.

The Just Label It coalition and I welcome the opportunity to work with the committee and with farmers, food manufacturers, and other stakeholders to craft a disclosure that is national, that is factual, that is mandatory, that works for consumers, and that

works for farmers and the food industry. You should not have to live in Vermont to know what is in your food and how it is grown.

The Des Moines Register in a 2014 editorial entitled, "It's Time for Congress to Require GMO Labeling" put it very simply. Quote, "Congress should set a nationwide standard of disclosure and then let the individual consumers decide whether the presence of GMOs in a product is something that concerns them. But keeping consumers in the dark is never the right thing to do," unquote.

In the absence of such a system, we urge the Senate to reject efforts to block state GMO disclosures or limit the administration's authority to develop a national solution. Such efforts contradict Congress's longstanding view that states should be able to require simple factual disclosures on food labels and that the FDA and USDA should have the authority to require disclosures that help consumers make informed decisions.

Farmers should, of course, have choices, and so, too, should consumers. The fastest creators of new on-farm and factory jobs are the companies and brands that are most transparently responsive to consumer desires. The 21st century consumer demands food that is, above all, transparent, and Congress as well as the food industry should honor and support and most certainly not block this fundamental right.

Thank you for the opportunity to testify and I look forward to your questions.

[The prepared statement of Mr. Hirshberg can be found on page 61 in the appendix.]

Chairman ROBERTS. We thank you, Mr. Hirshberg.

Mr. Jaffe.

STATEMENT OF GREGORY JAFFE, BIOTECHNOLOGY PROJECT DIRECTOR, CENTER FOR SCIENCE IN THE PUBLIC INTEREST, WASHINGTON, DC

Mr. JAFFE. Thank you, Chairman Roberts and Ranking Minority Member Stabenow and other committee members for inviting me as a witness on behalf of the Center for Science in the Public Interest.

It is appropriate to review and possibly modify the roles of the Food and Drug Administration, the USDA, and the EPA in ensuring those crops' safe use. While current GE crops grown in the U.S. are safe and beneficial, the federal regulatory oversight system needs improvements to ensure safety for future products and to provide consumers with confidence about their safety.

I am here today as the Director of CSPI's Biotechnology Project. CSPI is a nonprofit consumer organization that was established 44 years ago. CSPI works primarily on food safety and nutrition issues and publishes Nutrition Action Health letter to educate consumers on issues surrounding diet and health. CSPI does not receive any funding from industry or from the federal government. Our funding primarily comes from our members and donors, as well as from independent philanthropic foundations.

CSPI has long advised consumers, journalists, and policymakers that foods and ingredients made from currently grown GE crops are safe to eat. The current crops have also provided tremendous benefits to farmers and the environment in both the U.S. and

around the world. However, actions by developers selling GE seeds and by farmers growing GE crops have led to the highly troublesome development of insects and weeds that are resistant to widely used pesticides.

Today, I will limit my oral testimony primarily to legislative changes at FDA and USDA. CSPI believes that FDA should determine the safety of all GE food crops before foods from those crops enter our food supply. FDA should review the safety data submitted by the developer, conduct its own analysis of those data, and provide the developer and the public with its opinion of whether foods from that GE crop are safe to eat by humans and animals. This new regulatory process would further ensure safety of future crops and allay consumer concerns about biotechnology.

While GE crop developers in the United States have always completed the consultation process, there is no guarantee that they will continue complying with the consultation process in the future. Similarly, it is unclear whether GE crop developers in India or China would consult with FDA, especially since they may be exporting finished food products.

CSPI believes that a mandatory pre-market approval process by FDA should have the following four components. First, all genetically engineered crops, irrespective of their intended use, should go through that approval process.

Second, the mandatory approval process should be legally included in the Food, Drug, and Cosmetic Act as opposed to being established in an agency policy that could change at any time.

Third, after FDA has received public comments and completes its safety review, FDA must provide the developer and the public with its opinion about the GE crop's safety.

Finally, until FDA determines if the GE crop meets that safety standard, it would be illegal to market foods or ingredients made from that crop.

USDA regulates GE crops under its plant pest authority provided by the Plant Protection Act. To date, USDA has granted 117 petitions for non-regulated status and never once found a commercial GE crop that is a plant pest that requires continued oversight. Developers and USDA spend significant resources determining that a GE crop is not a plant pest when they could use those resources to analyze and address real impacts from GE crops, such as development of resistant weeds and pests or gene flow to wild relatives and non-GE farms.

In the last few years, a large loophole has emerged that allows developers of GE crops to avoid USDA's lengthy and expensive regulatory process. If a GE plant variety is developed without using any component of a listed pest, then USDA has no authority to regulate that crop, even its experimental trials. USDA's decision to exempt certain crops is not based on a scientific analysis that the particular crops are not risky and need no regulation, but instead the decision is solely because the crop is not captured by the narrow legal hook USDA uses to regulate GE crops.

Such arbitrary and non-scientific decisions undermine the regulatory system and its reputation with the public in the United States and our trading partners abroad. Congress should pass new legislation that would require USDA to regulate all gene crops,

whether developed here or abroad, and ensure that the review addresses the real and potential risks and impacts of those crops instead of expending resources addressing nonexistent plant pest risks.

I appreciate the time the committee has given me to testify today and I look forward to your questions.

[The prepared statement of Mr. Jaffe can be found on page 65 in the appendix.]

Chairman ROBERTS. We thank you, Mr. Jaffe.

Dr. Kleinman.

STATEMENT OF RONALD E. KLEINMAN, M.D., PHYSICIAN IN CHIEF, MASSGENERAL HOSPITAL FOR CHILDREN, BOSTON, MASSACHUSETTS

Dr. KLEINMAN. Chairman Roberts, Ranking Member Stabenow, thank you very much for asking me to appear today. As a pediatrician, I know that food safety is critically important to moms and to children and I am called upon to help parents understand facts and the fictions around food and nutrition, including GMOs.

Plant biotechnology has been with us safely for 20 years or more. Not a single human illness or adverse effect has been documented.

GM technology allows us to move a handful of carefully selected genes and traits among species and to achieve characteristics that conventional breeding will not permit. Commercial GM crops undergo testing and safety assessment that far exceeds the little, if any, testing of conventional varieties, despite the fact that GM technology is far more precise. Genes, DNA, RNA, and resulting proteins are a part of every living thing and, thus, every whole food we consume. Undue concern regarding a few carefully selected genes makes no biological sense when considered against the hundreds of thousands of untested genes and gene products in the natural diet.

In my professional opinion, existing GM crops are safe, based on the fundamental science of DNA, RNA, and protein in foods, upon extensive safety and compositional testing, and upon an extensive body of scientific studies, both short-and long-term.

Our current system for the review and safety assessment of GM crops by the FDA and EPA is robust and comprehensive. They are the most studied foods in history. The science and risk-based regulatory system we have in place is robust and provides a solid food safety and environmental affirmation to the American people.

The nutritional value of GM crops is assured via extensive compositional testing. Food labeling on GM content conveys no useful nutrition or safety information to consumers. It is often misleading and will simply present confusing and confounding information to consumers, including the parents that I personally advise.

Nutritional enhancement through GM technology is a reality. Globally, vitamin A deficiency afflicts millions of children annually with blindness, stunting, or death. The GM Golden Rice which provides this essential nutrient remains on the shelf is an incalculable tragedy.

In the developed world, we know that adult heart disease has its origins in the diet of children. Existing, approved, but currently un-

available GM offerings for heart health include vegetable oils very low in saturated fats and plant-derived oils providing benefits of long chain fatty acids found mainly in fish, the latter being underconsumed, expensive, and in short supply.

Globally, we must sustainably feed a growing population while conserving limited land, water, and other resources. GM crops have resulted in dramatic reductions in chemical insecticide use, support conservation tillage to retain soils and conserve water, and reduce fuel use and carbon footprint. Traits in development include improved water and nitrogen utilization and, therefore, enhanced yield, which, in combination with breeding and hybrid technology, will be essential to providing ongoing food security.

Much of the recent controversy surrounding GM crops revolves around the concomitant use of glyphosate. Improved techniques allow detection of minute quantities of chemicals in body fluids, but presence does not equal risk. Measurement of glyphosate demonstrates that intakes in the general population are far below allowable daily intakes determined to be safe by the EPA and by similar agencies globally. Reports of glyphosate in breast milk have not been replicated using validated techniques.

The recent opinion from the IARC that glyphosate is a probable human carcinogen is not supported by the data and flies in the face of comprehensive assessments from multiple agencies globally. Older allegations suggesting that glyphosate and GMOs are somehow associated with food allergy, autism, and other medical conditions are wholly unfounded speculation. Thus, concerns regarding glyphosate residues are unsupported and the fear-mongering surrounding them unjustifiable.

Despite the obesity problem, hunger remains a challenge in the U.S. today. Roughly one in five children live in households that are food insecure. This is often driven by economic limitations and often afflicting the most vulnerable children and the elderly. Suboptimal nutrition remains common in adults, with excessive intakes of saturated fats and inadequate intakes of long chain omega fatty acids. In the developing world, malnutrition and food security remain daunting challenges.

Enhanced sustainable food production is essential in both the developed and developing world. Advancing agricultural technology, including GM technology, is and will remain essential to meeting global production demands, and to not just meeting, but optimizing global nutrition.

So, in summary, this is essential not just for personal health, but for community health, global economic development, social order, and transnational security. Thank you very much.

[The prepared statement of Dr. Kleinman can be found on page 84 in the appendix.]

Chairman ROBERTS. I thank you, Doctor.

I am going to start with you. As a pediatrician, you obviously highlighted concerns related to both sound science and nutrition, and you talked about visiting with parents. Can you talk about your conversations with mothers about biotech, and can you speak about the importance of accurately trying to communicate to the public about science, especially as it relates to what you high-

lighted—food production, malnutrition, and hunger around the world?

Dr. KLEINMAN. Those are fairly broad questions, but I will do my best. As far as conversations with parents, I enjoy an open dialogue with all the parents that I talk to. I am often talking to them about nutrition and I usually start by asking what they have read on the Internet and what kinds of questions they have that they would like me to address.

At the end of those conversations, I always assure them that the food supply in the United States is safe as it is currently regulated and assessed and that issues raised about GMOs have not stood the test of scientific investigation over a very long period of time.

I think this whole issue of explaining GMOs to parents is complicated and not easily addressed in a couple of sentences. If I were to ask everyone in this room to raise their hand if they took a course in DNA chemistry or molecular biology, there would not be a lot of arms up in the air, and I think that is highlighted by two questions that I have seen on surveys about labeling GMOs.

The first is the question of whether people feel GMOs should be on the food label, and a substantial number of people will say yes to that question.

The second question, however, I think, highlights the issue, because when you ask those same people if we should label all foods that contain DNA, the same number of people raise their hands. All fruits and vegetables, meat, fish and fowl contain DNA. We consume DNA on a daily basis in significant quantities, and we also have a significant amount of foreign DNA in our own bodies. The germs that inhabit our intestine all have DNA, and there are thousands of trillions of those germs.

So, that is the challenge. It is simplifying this in a way that reassures people that we have a safe food supply, explaining that the efforts to ensure that the food is safe are adequate and appropriate, and that these new technologies do not change that risk at all and that they have been carefully assessed over a period of 20 years to give us that guarantee.

The last thing I will say is that it is not easy standing up and defending GMO today. This has become really an era in which ad hominem attacks on those who disagree with others are very difficult to tolerate. We see now the use of the Freedom of Information Act, for example, directed against a whole range of academic investigators, scientists who have spent careers looking at GMOs and how they behave, both with the environment and with human health, and many of these people are now being subjected to severe personal attacks and Freedom of Information Act requests.

So, I think we have a big challenge before us, but I hope that many who counsel parents directly, who have a forum and can speak to this in a public way, will be able to work with government agencies like we heard this morning the members of the first panel discuss so that we can assure the population of the United States that they have nothing to fear from GMOs as they are currently used.

Mrs. LIDBACK. Chairman Roberts, may I add a quick comment?

Chairman ROBERTS. Certainly.

Mrs. LIDBACK. I talk about biotech crops with my pediatrician all the time, and he is very much in support of me being here and sharing my perspective and my message about biotech crops. Thank you.

Chairman ROBERTS. I appreciate that very much.

I have exhausted my time limit, but it was for good purpose. Doctor, thank you so much for a very eloquent and persuasive response, and I thank you for what you are doing.

Dr. KLEINMAN. Thank you.

Chairman ROBERTS. As a matter of fact, I know of three individuals that you could visit with. They happen to be my kids and grandchildren. So, maybe we can work that out. Thank you.

I had other questions, but I think I will yield to the distinguished Ranking Member.

Senator STABENOW. Thank you very much, Mr. Chairman, and thank you to all of you for your important testimony.

Mr. Hirshberg, I wanted to start with you today because you have long been a leader in the call for mandatory labeling of genetically modified food. You talked about in your testimony that this was a direct result of your experience running a large food company, so I wondered if you could talk about what motivated you to be where you are today as an advocate in bringing together businesses and leaders on this issue.

Mr. HIRSHBERG. Thank you, Senator. When we started 32 years ago, my company, there was, of course, no organic industry, and the world has changed dramatically since that time. We now have, as I mentioned, a $40 billion sector. This growth in this sector has been strictly and completely a result of responding to consumer demand for transparency about what is in our foods and how they are grown. The company and the industry, indeed, have evolved to be engaged in highly robust contact with consumers, because, frankly, that has been our strength, our competitive strength.

But, by 2011, questions about GMOs really dominated Stonyfield's social media. This is before the creation of "Just Label It" and certainly before any of these state efforts. What we have deduced, and only deduced since then, and I think you have heard ample evidence of it today, is complete and utter confusion out there.

We have had a voluntary labeling guidance from the FDA since 2001, and yet confusion runs amok, questions of does not natural prohibit GMOs, et cetera, and I could go into many more examples. But, in the interest of time, I would simply say that despite the voluntary labeling system, it has not addressed the confusion. In fact, I might even go further and say that I believe that the trust issue that has been talked about with many of the Senators' questions today could be addressed by simply going ahead and having a value-neutral label. I think it would put the trust issue to rest, because we would be stating a fact to consumers.

In any case, to your point, these questions and this confusion is really, in our view in industry, a logical consequence of the rapid success of GMOs, which has certainly been talked about today. Two-thirds of acreage planted in the U.S. is now GMO, as has been mentioned.

But it also came to a head for me when HTA—herbicide tolerant alfalfa—was approved in 2011 and we came to understand the quarter-billion pounds of glyphosate that has been referenced today, now being used per year, super weeds as a result in over 60 million acres and the need to use 2,4–D, et cetera. Indeed, herbicide use has gone up. That is a fact. It is USDA survey data. So, we recognize that this extraordinary change in U.S. agriculture has happened in less than a generation with no citizen or consumer input and that 64 other nations had solved this problem with mandatory disclosure.

So, from our vantage point, we recognize that the FDA has the authority under the Federal Food, Drug, and Cosmetic Act to implement mandatory labeling, just as they have with many other foods and many other attributes. We organized "Just Label It" to seek mandatory disclosure to address this confusion and choice and to engage the marketplace.

I would say quickly that I share the same opinion as you have heard from many of my co-panelists today. America needs help now resolving this. This is crafting a disclosure system that is value-neutral. I certainly do not support, nor have we supported, the 50-state patchwork solution. That would be a nightmare for all of us. Thank you.

Senator STABENOW. Thank you. Just as a follow-up, because I was going to ask you——

Chairman ROBERTS. Dr. Kleinman wanted to——

Senator STABENOW. Oh, yes. Dr. Kleinman, did you want to respond?

Dr. KLEINMAN. If I might just add to that briefly, we all applaud an effort towards transparency, and transparency in the production process seems to be a laudable goal. But these efforts that we are talking about today are purely restricted to transparency about GMOs. There are some 3,000 fruits and vegetables today that are produced from seeds that are developed using chemical and radiation mutagenesis. We do not talk at all about labeling those. There are fruits and vegetables that are produced using exploited labor. We do not talk at all about labeling that.

I am not going to go on and on about this, I promise, but how much do we put on that label? What is the difference between need to know and right to know? I think Senator Heitkamp was getting at that in her question that she addressed to the first panel. So, I will stop there.

Senator STABENOW. Yes, thank you very much.

I did want to do just a quick follow-up with Mr. Hirshberg, though, because I wanted to get your perspective on how we provide consumers the right to know. People want to know about their food and are more engaged, and that is a good thing, that people are more engaged in this whole process. I mentioned in the farm bill part of our reason, part of my push to make sure we were doing more around choices for people was to really address that important desire.

But, how do we do that without stigmatizing biotechnology or having this interpreted as a food safety warning? That is the concern from industry's standpoint, when you have heard all of the

issues as it relates to safety. Yet, at the same time, consumers have a right to know.

Mr. HIRSHBERG. Yes. Well, I will be brief, but we fully support and agree with you. You cannot stigmatize. Farmers need choice. Consumers need choice. From the beginning, as I said before, before any state initiative had been launched, we were advocating for factual value-neutral presence disclosure, mandatory so that the playing field is level. As we have seen with the NLEA and other valuable legislation, when you have a level playing field, it really stimulates innovation and is fair to emerging smaller operators. National, again, not the 50-state solution. Acceptable to farmers, acceptable to consumers, and acceptable for industry.

In other words, all stakeholders need to agree, this works, and we are open, from Just Label It's perspective, to any system. The focus has been on labels, but certainly there is a lot of discussion about technology. Any discussion. Our plea is to bring the stakeholders together for a constructive discussion about a value-neutral solution. We have not been prescriptive intentionally because we know many stakeholders need to weigh in.

I will quickly say in closing, in response to you, that to us, the European standard makes the most sense. It is two words. They are innocuous. They are value-neutral in the ingredient panel. It seems to be similar. But we are open to technology. We have a lot of questions about how scanners would work and so on and so forth, but again, we need to be open.

This is a problem that need to be solved, as the Senators know, and you have heard ample evidence of it today. This discussion is raging in 35 states. Vermont is not the only state that has taken this up. Three other states have passed. Several more will be passing. So, it really needs to be solved at the national level, and it really does need to be non-disparaging. Thank you.

Senator STABENOW. Thank you.

Thank you, Mr. Chairman.

Chairman ROBERTS. Senator Hoeven is next. Senator Donnelly, welcome to this discussion, and I will recognize you next. But I am going to take the Chairman's prerogative here to ask Mr. Thomas, hearing Mr. Hirshberg, how could your company manage any additional cost to implement what he is talking about?

Mr. THOMAS. Well, obviously, there would be costs. I am impressed with how much agreement that there is across these different persons testifying.

You know, I think we would support a government determined standard for non-GMO or GMO particularly declared foods. I think I would disagree with the point of doing it as a mandatory label. I believe that the vast testimony that we have heard this morning supports that our foods are safe. I understand that there is great consumer interest and curiosity around this issue. To respond with a determination of it is GMO or it is not GMO, I think, does not really aid the consumers' curiosity and maybe even lack of information that they have had thus far. I think it would tend to make it more misunderstood because you would have it interpreted as a pass/fail indicator on packaging.

So, I support the voluntary use of it. I think the market is working pretty well right now and that there are many products that are——

Chairman ROBERTS. But who would pay the cost? I mean, how would you handle the cost?

Mr. THOMAS. Well, ultimately, the cost gets passed on to the consumer or else you go out of business, so to analyze products, to change all of our packaging, I mean, over time, it can be absorbed as a cost of doing business, but——

Chairman ROBERTS. What I am worried about is—well, I am worried about that, but I am worried about any mandate that comes from Washington, with all due respect——

Mr. THOMAS. Right.

Chairman ROBERTS. —how ably described or what flag you are waving.

Mr. THOMAS. Ultimately, those costs do get passed through to the end user.

Chairman ROBERTS. I am worried about them going back down to the farmer and the rancher.

Mr. HIRSHBERG. Mr. Chairman, may I respond? We, as was mentioned earlier today, I believe, we change our labels almost annually. If you look across the food industry, every time a Disney movie comes out or a Super Bowl hero comes through, companies change their labels. It is a routine part of business. So, the act of changing the label itself has never been passed along to either our end user or our supply. It is just a normal——

Chairman ROBERTS. Well, with all due respect, Mr. Hirshberg, a Disney label is a little bit different than what we are talking about on a pass/fail kind of test mentioned by Mr. Thomas on the safety of our food supply.

I am going to move on and mention, Mr. Hoeven—I do not mean to cut you off—Mr. Hoeven, Senator Hoeven, dear friend and colleague, please proceed.

Senator HOEVEN. Thank you, Mr. Chairman.

I would like to ask each of the witnesses, do you believe that genetically engineered plants are safe, starting with Mrs. Lidback.

Mrs. LIDBACK. Yes, I do.

Senator HOEVEN. Mr. Thomas.

Mr. THOMAS. Yes, I do.

Senator HOEVEN. Mr. Hirshberg.

Mr. HIRSHBERG. The evidence is clear from the earlier panel that this is our federal policy and I am not qualified to disagree with it. I would only say that there is significant debate and discussion that has not been included in today's discussion.

Senator HOEVEN. Mr. Jaffe.

Mr. JAFFE. For the current crops that are grown in the United States, yes.

Senator HOEVEN. Dr. Kleinman.

Dr. KLEINMAN. Yes, they are safe, and I think that this has been demonstrated and agreed to by over 240 international oversight agencies and scientific groups.

Senator HOEVEN. For both Mr. Thomas and Mr. Jaffe, if there is not labeling, and it is not a food safety issue but consumers still want to know more about GMO as it pertains to any food they are

purchasing, what are the ways they would do that? Maybe, Mr. Thomas, you could start on that.

Mr. THOMAS. Well, there is—I think the market is responding to the interest in some of these organic or natural products and there are products that have been flooding the market. They are pretty clearly labeled. Those products are made with great intention. They are sourced, the ingredients are sourced. They are formulated with great intention to deliver those products to market. So, companies are taking advantage of commercializing that interest and are putting big call-outs on the packaging. So, I think the determinant or whether a product is or is not is already well underway. I think it could be polished a little bit through the voluntary program we have talked about here.

You know, social media today, there is certainly a lot of information that is out there, and one of the things that I would say that as we get communication from our customers, the questions are more broad than—we are not being flooded by inquiries as to specific products and what have you. I think they are getting their information from the media and broader sources than individual companies.

Senator HOEVEN. Mr. Jaffe.

Mr. JAFFE. So, I think transparency is very important to consumers and I think consumers are looking for information about lots of things regarding their foods. I think that, little by little, the industry needs to move to have increased transparency so that if consumers want to find out more details about the foods that they are buying, they can find that out.

In terms of specifically knowing about genetically engineered ingredients in foods, I would alert the committee to Wegman's supermarket chain. They have done a really excellent job in a Q&A about GMOs and why they support the farmers who are growing them, where they are in their supermarket, which products people can find contain GMOs and which products they can buy to avoid them. Wegman's did what I thought was an extremely good job of being both neutral, explaining the regulatory system, the safety, as well as where they are and why they support farmers growing those crops.

Senator HOEVEN. Mr. Jaffe, how do they do that? How is that provided?

Mr. JAFFE. It is on their website.

Senator HOEVEN. On their website.

Mr. JAFFE. They have a series of frequently asked questions. But, also, if you are a customer of Wegman's, you know they have a quarterly magazine and in that quarterly magazine, Danny Wegman, the chairman or CEO—I am not sure of his position—wrote a letter about Wegman's position on GMOs. They also put it on their blog. So, they——

Senator HOEVEN. So, it is on their website——

Mr. JAFFE. —they expressed it in a number of ways.

Senator HOEVEN. It is on their website, but not specifically on all their food products, or is there a reference on the food product to the website?

Mr. JAFFE. I do not think they are on their food products.

Senator HOEVEN. Okay. Mr. Hirshberg, when you talk about a value-neutral label, please, what is that? Describe it.

Mr. HIRSHBERG. Thank you, sir. Again, as I mentioned, in Europe and throughout most of the world, the standard is including two words in the ingredient label. If it is a genetically engineered soy or genetically engineered corn, it would be identified as such. As was mentioned in the earlier panel, we have tremendous scientific ability now to test and sense even minute amounts. You might recall the discussion earlier about the large shipping containers. So, these programs just simply identify the presence, the factual presence in the supply chain.

Senator HOEVEN. Dr. Kleinman, do you have any recommendations about how the federal government could better communicate and convey the safety of GMO products?

Dr. KLEINMAN. I do not think the way to do that is to put a mandatory requirement for GMOs on labels. I think, certainly, that a well designed effort within the agencies that we heard from this morning towards this effort would be very welcome. I do not think that currently exists, and I think it is extremely important. It is analogous to what Mr. Jaffe was just describing at Wegman's. It is very possible to create information for the Internet, in brochures, in various other forms of media, and the government can play a role in that just as producers and distributors can do that.

So, I think this is a concerted effort by all of us who have an opportunity to educate the consumers to take that opportunity and to run with it. In particular, I think, as I said, creating a specific effort in government towards communication is very important.

Senator HOEVEN. Thank you.

Chairman ROBERTS. Senator Donnelly.

Senator DONNELLY. Thank you, Mr. Chairman.

Mrs. Lidback, you come from a very beautiful area. I think I represent a beautiful state, too. I know you have young kids on the farm, and protecting the environment is important to you, as it is to the farmers in my state. You testified biotech goes hand-in-hand with various conservation practices, things like cover crops and no till as well as significantly reduced pesticide use. Can you speak in more detail to the ways you have seen the genetically engineered crops change the way you farm and how it helps the environment in regards to similar things like cover crops and no till?

Mrs. LIDBACK. Okay. Thanks for the question, Senator. I can speak to how my neighbors farm. We actually only grow grass. We do not grow biotech crops. But, I can tell you that they spray less pesticides, which in turn means that they are going over the ground less. There is less soil impaction and less soil erosion.

The no till cropping, a neighbor—actually, she just posted on Facebook about using glyphosate in order to convert one of her hilly fields into—from grass into corn for next year, and the first step is to spray glyphosate to get rid of the grass, and then they will use no till planting because of the hilly nature of their field so it helps to prevent soil erosion.

Cover crops were once thought to not be an option for our area because of the cold weather, but more and more folks, specifically farmers that I work with directly, are utilizing cover crops along with growing biotech crops. Actually, Vermont has one of the high-

est rates of GE crops grown—corn grown for silage in the country, and so they are utilizing that seed with cover cropping and no till, given the need of their farm, trying to make the best of their resources.

Senator DONNELLY. Thank you.

Mr. Thomas, one of my great passions is small business and family businesses. I must say, I have consumed your products and they are of extraordinarily high quality—on numerous occasions. But, when I look at a company like yours, we have talked to a number of Indiana firms who have come into our office and said, here are the challenges we face. Here are the challenges that this will cause.

We have some ice cream companies. I have heard there is an ice cream company in Vermont, Mr. Hirshberg. I do not know if that is true or not, but we have some ice cream companies in Indiana, too, and they said, we have 68 varieties times 50 different labels. If it gets to a certain point, it becomes unworkable for us.

What are the kind of challenges you anticipate? I know you have talked about it a little bit before, as to how difficult this will be on a firm like yours. Is it a series of accumulating challenges that you are looking at, then?

Mr. THOMAS. I think it depends on if it would be state by state or a mandatory enforcement that was done in a short period of time. Obviously, that would accelerate our changing of packaging, and the costs that I alluded to are real. To change 411 SKUs of our product would cost close to $2 million. So, those are real costs.

I think, obviously, there would be great incentive, I think, if it was a mandatory practice because people would, probably look more at how they land on the non-GMO. I am not making a judgment whether that is the right thing to do or not.

So, there are costs in segmenting the product. Now you have to segment. Your manufacturing processes become a lot more complicated as you have to protect one product from the others to prevent cross-contamination. So, through complexity, higher raw material costs, changing of packaging, all those things contribute increased costs of manufacturing.

Senator DONNELLY. Thank you.

Mr. THOMAS. Also marketing.

Senator DONNELLY. Thanks.

Mr. Jaffe, one of the things I have looked at has been barriers to international agricultural trade caused by varying approval processes for GE foods. Indiana grain producers are suffering because of drawn-out approvals for their products within the United States and also overseas in, like, the Chinese regulatory systems. You discussed the need for a U.S. regulatory system consistent with those in other countries. So, the question is, do you believe it is possible for an updated U.S. regulatory policy to reduce trade barriers in countries like China, and how would current regulations need to shift in order to do that and to promote our trade?

Mr. JAFFE. So, the short answer is, I think that having FDA more involved in the oversight of GE crops with an approval process where they give their opinion about safety will actually help both our exporting of crops and ensuring the safety of our importing of foods.

I can give the example, so, right now, as was said in the earlier testimony on the first panel, FDA does not give its opinion about the foods and it does not explain why those GE crops are safe. So, therefore, China, for example, has nothing to rely upon from our country. They have to start from scratch in doing their own food safety assessment.

I have worked, for example, in Vietnam, and Vietnam has now passed a regulation to implement their regulatory system that says if there are five countries that follow the OECD guidelines and approved a GE food, for grain, for an import, then they do not have to go through and approve it. It is automatically approved in that country. We are seeing that kind of regulation occurring in other countries around the world.

The problem is, the U.S. does not have an approval for GE food, so we may not count as one of those five. I think if we want to get streamlined processes, we have to put our own opinion on the table first for those crops so that others can rely upon it. Our FDA is independent. It is one of the most well respected regulatory agencies around the world. Yet here, as you heard in the first panel, it avoids coming forward and saying that it thinks that these crops are safe. So, I think that would help consumer confidence in the U.S. but would also help the export of our grain products.

[I have since found out that Vietnam does count the FDA voluntary consultation submission as an approval for purposes of allowing an engineered crop into its country for food of feed purposes.]

It would also help the imports in the sense that China will, sooner or later, have BT rice, genetically engineered rice, and when they do that, we are not going to grow it in our country, but we will import the rice noodles, and will they go through that consultation process? I am not convinced of it. So, I think there are big advantages here.

Senator DONNELLY. Thank you to the panel, and Mrs. Lidback, come back with your family some day and enjoy this process without being behind a table.

Chairman ROBERTS. Senator Stabenow.

Senator STABENOW. Well, Mr. Chairman, I just want to thank you for the hearing and everyone on the panel and members. Obviously, there is a great deal of interest in this.

I want to just indicate as we close that we have been talking a lot about science today, and I believe in science, and because I believe in science, I know that climate change is real. Because I believe in science, I believe that genetically modified foods are safe. I hope we will continue to focus on science and I am also hopeful that we can come together in a bipartisan way that addresses the legitimate and growing concerns of consumers about having information about their food. Thank you.

Chairman ROBERTS. Thank you, Senator.

Today, we have heard clearly from the regulators that agriculture biotechnology is safe, and foods consisting of such ingredients are safe. As this committee and the Senate moves forward to address issues on labeling or other regulations, it seems to me we must keep in mind the role of government and the mandates imposed by the government, mandates at any level of government,

should be based on science and address the concerns of health and safety. Mandating regulations based on any metric with any yardstick other than science, health, and safety exceeds the role of government.

If producers and manufacturers want to meet consumer demand for food product information not based on science, health, and safety, then they have every right and opportunity today to meet those demands, and it is important to meet those consumer demands, because I can assure you the most effective tool consumers have to change our food system is in their pocketbooks.

To my fellow members, we would ask any additional questions you may have for the record be submitted to the committee clerk five business days from today, or by 5:00 next Wednesday, October 28.

Thank you to the panel and all the patience that you have demonstrated.

The committee is adjourned.

[Whereupon, at 1:03 p.m., the committee was adjourned.]

A P P E N D I X

OCTOBER 21, 2015

Statement of Michael Gregoire
Associate Administrator
Animal and Plant Health Inspection Service
U.S. Department of Agriculture

Before the

Senate Committee on Agriculture, Nutrition and Forestry

October 21, 2015

Chairman Roberts, Senator Stabenow, and members of the Committee, thank you for the opportunity to appear before you today to discuss an important topic to American agriculture – the complex issues surrounding biotechnology and the federal government's role in regulating it.

I am Michael Gregoire, Associate Administrator of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). APHIS is responsible for ensuring that new biotechnology advances do not inadvertently harm plant health. Prior to becoming Associate Administrator, I led APHIS' Biotechnology Regulatory Services program.

In support of USDA's efforts to expand U.S. agriculture, we at APHIS must ensure that our regulatory oversight is timely, consistent, effective, and grounded in sound science. We must ensure that we keep pace with the latest scientific developments, and that we do so transparently. The Plant Protection Act gives APHIS, through the delegated authority of the Secretary, the ability to prohibit or restrict the importation, exportation, and interstate movement of plants, plant products, certain biological control organisms, noxious weeds, and plant pests. It is under these authorities that APHIS regulates the importation, interstate movement, and field testing of genetically engineered (GE) organisms. Today, I am going to discuss how we use these authorities, and the steps we have taken and are taking to ensure a robust process.

APHIS' Role in Biotechnology

APHIS' specific role is to ensure that new GE crops don't pose a plant pest risk—such as causing disease or damage to other crops or plant products in the United States. If a GE product requires USDA oversight, developers must apply for an APHIS permit or notification and adhere to APHIS' regulations to maintain adequate confinement of a regulated organism during field trials. [1] We require applicants to submit detailed information for thorough review by our scientists before any regulated activities are allowed.

After developers have the scientific information which they believe is sufficient for us to conclude that a GE organism is unlikely to pose a plant pest risk, they can petition APHIS for non-regulated status. We then prepare the appropriate environmental analysis, as required under the National Environmental Policy Act, as well as an assessment of the potential plant health risks to agriculture, including changes to agronomic practices. APHIS makes these draft

[1] 7 C.F.R. § 340.

assessments available to the public for review and comment. Then, if our officials conclude that a GE organism does not pose a plant health risk, APHIS deregulates it and the GE organism may be freely moved or planted without APHIS permits or other APHIS regulatory oversight. However, additional regulatory oversight and/or consultation with the other Federal agencies may be necessary if the GE product has a pesticidal quality or will be commercialized as a food or feed product.

Biotechnology Petition Improvement

Over the past several years, APHIS has undertaken a process to significantly improve the timeliness of its biotechnology regulatory decisions—with great results. We have been able to provide a more timely review process that doesn't sacrifice the thoroughness or quality of our scientific reviews, while also giving the public an earlier opportunity to provide us with input and information that can help our scientific review of new GE products.

In 2010, APHIS' biotechnology program began a business process improvement to help address concerns about the length of time it takes the Agency to deregulate GE products. Based on the results of that review, in March 2012, APHIS implemented a new process for petitions that require an environmental assessment (EA) and not an Environmental Impact Statement (EIS). The new process created two paths for these petitions: one for products which APHIS has familiarity with and that raise no new issues, and one for new products or products that may raise new concerns. Prior to the change in process, it often took USDA three or more years to complete a determination. Now, the target timeframes for reaching a determination are 13 months and 15 months, respectively. We have also given the public an additional and earlier chance to provide comments when we first publish a petition, in addition to when we publish our draft EA and plant pest risk assessment, which also provide opportunities for review and comment.

APHIS has made significant progress in reaching the goals we set out, while maintaining our robust scientific and environmental reviews. Of the 23 pending determinations when the new process was put in place, only one remains – and it requires an EIS, which falls outside the scope of the process improvement. APHIS has received 14 new petitions since the process was put in place. Of those, eight have been deregulated, and three of the remaining six should be complete by the end of calendar year 2015. In summary, APHIS has completed 30 of the 37 pending and new petitions since implementing our new process in March 2012, and plans to complete 3 more by the end of the year.

Since March of 2012, we also cut the time down for review of new petitions from between three to five years, to just over 18 months. We have a process in place that we believe will allow us to soon reduce that review period further down to 15 months.

Lastly, while not part of the business process improvement effort, we have made strides with products that require a full environmental impact statement (EIS) and thus require a longer period of time to complete. Over the last few years, APHIS has devoted additional staff to complying with these environmental regulations. While completing an EIS still takes additional

time, that last two we completed were done in about half the time of previous EISs, all while improving the quality of the analysis.

Which Products Are Regulated?

As previously mentioned, APHIS' authority to regulate GE products is based solely on their potential plant pest risk; we do not regulate GE products per se. We regulate any organism which has been altered or produced through genetic engineering, if the donor organism, recipient organism, or vector or vector agent is a plant pest as defined in our regulations; or if it is or contains an unclassified organism, as well as any other organism or product altered or produced through genetic engineering which we determine is a plant pest or have reason to believe is a plant pest. APHIS does not consider any specific method of plant development to be inherently safer than any other technique. As envisioned by the Coordinated Framework, we regulate based on the specific product and the environment into which it is being introduced, not the production process that created it.

In some cases, developers may seek a written determination from APHIS if they are unsure whether or not their product requires APHIS regulatory oversight. Through this process, known as "Am I regulated?", the developer must provide scientific data, the technology used, and other information about the GE organism. APHIS will then evaluate whether the product itself is a plant pest, whether a plant pest was used during the genetic engineering process, and whether the final product contains genetic material from a plant pest to determine if it is regulated. If the product is not subject to our biotechnology regulations, APHIS issues a letter to the developer indicating such and publishes it on our Web site. GE organisms not regulated under our regulations may still be subject to other APHIS regulations as well as Environmental Protection Agency (EPA) and/or Food and Drug Administration (FDA) regulations.

Coordination with FDA and EPA

APHIS works regularly with FDA and EPA to ensure that the development, testing, and use of biotechnology products happens in a way that is safe for plant and animal health, human health, and the environment. FDA has primary responsibility for ensuring the safety of human food and animal feed, as well as proper labeling and safety of all GE plant-derived foods and feeds. EPA regulates pesticides, including crops with plant-incorporated protectants (pesticides intended to be produced and used in a living plant) to ensure public safety. EPA also establishes tolerances for pesticide residue on food and these tolerances are then enforced by FDA.

Depending on the characteristics of a biotechnology product in question, it may be subject to the jurisdiction of one or more of our three agencies. APHIS officials regularly communicate and exchange information with FDA and EPA to ensure that any safety or regulatory issues that may arise are appropriately resolved. We have great confidence in the safety of GE crops approved under the current U.S. regulatory system.

Recently, on July 2, 2015, the Executive Office of the President (EOP) released a memo that directed EPA, FDA, and USDA to work with the EOP to update the Coordinated Framework of 1986, (elaborated in 1992), that guides the U.S. Government in regulating products of modern

biotechnology. The Coordinated Framework establishes the U.S. Government policy on how the regulatory agencies work together effectively and establishes high level policy on how to regulate. It does not specify regulations themselves.

APHIS is working closely with the EOP and its interagency partners as we work to clarify the current roles and responsibilities of the three regulatory agencies, develop a long-term strategy to ensure that the system is prepared for the future products of biotechnology, commission an expert analysis of the future landscape of biotechnology products to support this effort, and work with the EOP and relevant budgeting authorities to ensure a plan to support implementation of this effort. Recently, on October 6, 2015, the National Science and Technology Council issued a request for information, soliciting data and information to assist as we undertake this effort.

Updating USDA's Biotechnology Regulations (7 CFR Part 340)

Complementing the interagency effort to update the Coordinated Framework is our renewed effort to revise APHIS' regulations. This effort will support the current regulatory policy described by the Coordinated Framework, the White House guidance of 2011 on 'Principles for Regulation and Oversight of Emerging Technologies', and any future changes that come out of efforts related to updating the Coordinated Framework.

In 2008, we published a proposed rule to significantly revise our biotechnology regulations under the Plant Protection Act. The proposed revisions were extensive and included significant changes to the scope of the regulations and the mechanics of APHIS' regulatory oversight. In March 2015, APHIS withdrew the 2008 proposed rule. This decision was based primarily on our review and consideration of more than 88,300 comments received on the proposed rule; our experience in regulating GE organisms over the past 28 years; and the Agency's desire to begin fresh stakeholder engagement aimed at exploring alternative policy approaches to regulation. To initiate our public engagement, in May 2015, we conducted 3 webinars and took comments via Regulations.Gov to gain insight into the public's current thinking. We are currently analyzing the over 221,000 comments received.

In addition, late this year we plan to publish a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) to analyze the impacts of our proposed new rule. Through the EIS scoping process, we will get public input on the proposed action and alternatives to determine the breadth of issues that should be considered in the EIS. We will use the best available science, and incorporate our past 28 years of experience in developing a new proposed rule for risk-based regulation.

While we are still working out the specifics and examining public input, we expect the new proposed rule to modernize our regulations in a number of areas, all within our current statutory authority. We plan to align our regulations with current authorities and regulate GE organisms that pose plant pest or weed risks in a manner that balances oversight and risk, and that is based on the best available science. We plan to continue to engage the public throughout the rulemaking process and provide ample opportunity for the public to participate in the process. The next opportunity will be during a meeting on November 18 to update stakeholders on our progress.

Based on these efforts, hopefully it is apparent that USDA and the federal government overall is committed to a sound, science-based, and modern approach to the regulation of products derived from biotechnology. We at APHIS will continue to work with our federal partners and with stakeholders as we build upon our many years of work in this area. This concludes my testimony. I would be happy to answer any questions.

Testimony of Gary Hirshberg

Before the

Senate Committee on Agriculture

On

Agriculture Biotechnology: A Look at Federal Regulation
and Stakeholder Perspectives

October 20, 2015

Thank you Chairman Roberts and Ranking Member Stabenow for the opportunity to testify today.

My name is Gary Hirshberg and I am the co-founder, chairman and former 30-year CEO of Stonyfield Farm. I also serve or have served as a director and advisor for numerous conventional and organic food and beverage companies now owned by firms such as Coca-Cola, Hormel and General Mills.

Today, however, I am appearing as Chairman of Just Label It, a coalition of more than 700 businesses and organizations dedicated to a mandatory disclosure system for products containing genetically modified organisms or GMOs.

I have seen first-hand a remarkable and encouraging shift in consumer interest in food in the last 20 years. Consumers – especially millennials – are demanding transparency as never before. Consumer interest in food and farming is a trend that should be welcomed because our food choices have an enormous impact on our health and on the health of our environment.

Growth in demand for sustainably grown food is also good for agriculture because two decades of double-digit annual growth in these categories is creating billions of dollars of new

revenue, creating millions of jobs, and creating new opportunities for farmers, especially younger farmers. When I started Stonyfield, most consumers had no idea what "organic" meant. Now, annual organic sales are nearing $40 billion, and most of the nation's largest food manufacturers are actively engaged in the category.

Our position is simple: Consumers have the right to know what is in their food and how it is grown – the same right held by citizens in 64 nations. Recent polling and consumer data tell us that nine out of ten Americans - regardless of age, income, race or party affiliation - want the right to know whether the food they eat and purchase for their families contains GMOs.[1] Consumers give many reasons for wanting these disclosures, but chief among them is the extent to which GMO crops have increased the use of herbicides linked to serious health problems.

Let me be very clear: we strongly support a national GMO disclosure system that provides factual information. We do not support a warning or a disclosure system that renders a judgment on GMOs and are certainly not seeking a ban on GMO crops. Rather, we support a value-neutral disclosure that respects the right of consumers to make their own choices.

Actual experience shows that food prices have not increased in the 64 countries that have adopted GMO labels, nor do consumers in these countries view GMO disclosures as warnings. At the same time that GMO disclosures have been adopted around the globe, GMO crop acreage has steadily increased – from 27 million acres in 1997, when the first GMO label was introduced, to 448 million acres in 2014.[2]

The world's second largest producer of GMO crops – Brazil – implemented mandatory GMO labeling[3] in 2003, yet less than 1% of food sales in Brazil are organic[4] and Brazilians have

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[1] The Mellman Group, for Just Label It, at http://4bgr3aepis44c9bxt1ulxsyq.wpengine.netdna-cdn.com/wp-content/uploads/2015/06/2015JLISurvey.pdf

[2] James, Clive. 2014. Global Status of Commercialized Biotech/GM Crops: 2014. *ISAAA Brief* No. 49. ISAAA: Ithaca, NY.

[3] Library of Congress. 2015. Restrictions on Genetically Modified Organisms: Brazil. <http://www.loc.gov/law/help/restrictions-on-gmos/brazil.php>.

accepted GMO foods in the marketplace.[5] Claims that a mandatory disclosure would disrupt GMO expansion were disproved by actual marketplace experience.

I know from my own experience that food companies change our labels all the time to highlight new innovations and that food companies and farmers already segregate GMO and conventional ingredients to serve our markets at home and abroad. I also know from experience that a value-neutral disclosure will not cause sudden shifts in consumer behavior. A recent five-year study of consumer data confirmed that American consumers will not view a GMO disclosure as a warning.[6]

The Just Label It coalition and I welcome the opportunity to work with the Committee and with farmers, food manufacturers, and other stakeholders to craft a disclosure that is national, that is mandatory, that works for consumers, and that works for the food industry. You should not have to live in Vermont to know what's in your food and how it's grown. The Des Moines Register, in a 2014 editorial[7] entitled "It's Time for Congress to Require GMO Labeling" put it simply –

> *"Congress should set a nationwide standard of disclosure and then let the individual consumers decide whether the presence of GMOs in a product is something that concerns them. But keeping consumers in the dark is never the right thing to do."*

In the absence of such a system, we urge the Senate to reject efforts to block state GMO disclosures or limit the Administration's authority to develop a national solution. Such efforts

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[4] Bruha, Patrick. 2015. Organic Food Market In Brazil. *The Brazil Business.* <http://thebrazilbusiness.com/article/organic-food-market-in-brazil>. 13 May 2015.
[5] González, et al. 2009. Consumer Acceptance of Second-Generation GM Foods: The Case of Biofortified Cassava in the North-east of Brazil. *Journal of Agricultural Economics.* Vol. 60, Issue 3, pp. 604-624.
[6] Reidel, John C. 2015. New Study: Consumers Don't View GMO Labels as Negative 'Warnings.' *University Commons.* <http://www.uvm.edu/~uvmpr/?Page=news&storyID=21203&category=uvmhome>.
[7] The Des Moines Register Editorial Board. It's Time for Congress to Require GMO Labeling. 25 July 2014.

contradict Congress' longstanding view that states should be able to require simple factual disclosures on food labels and that the FDA and USDA should have the authority to require disclosures that help consumers make informed decisions.

Farmers should of course have choices. And so too should consumers. The fastest creators of new on-farm and factory jobs are the companies and brands that are most transparently responsive to consumer desires. The 21st century consumer demands food that is, above all, transparent, and Congress as well as the food industry should honor and support, and most certainly not block, this fundamental right.

Thank you for the opportunity to testify. I look forward to your questions.

Testimony of Gregory Jaffe
Biotechnology Project Director
Center for Science in the Public Interest
Senate Agriculture Committee Hearing
"Agricultural Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives"
October 21, 2015.

I want to thank Chairman Senator Pat Roberts, Ranking Minority member Senator Debbie Stabenow, and other committee members for inviting me as a witness on behalf of the Center for Science in the Public Interest (CSPI). After more than twenty years of regulating genetically engineered (GE) crops, it is appropriate to review and possibly modify the roles of the Food and Drug Administration (FDA), United States Department of Agriculture (USDA), and Environmental Protection Agency (EPA) in ensuring those crops' safe use. While the current GE crops grown in the United States are safe and beneficial, the federal regulatory oversight system needs significant improvements to ensure safety for future products and to provide consumers with confidence about their safety.

I am here today as the director of CSPI's Biotechnology Project. CSPI is a non-profit consumer organization that was established 44 years ago. CSPI works primarily on food safety and nutrition issues and publishes *Nutrition Action Healthletter* to educate consumers on issues surrounding diet and health. CSPI advocates, based on the best-available science, on behalf of consumers at federal agencies, Congress, and international organizations. CSPI does not receive any funding from industry or the federal government. That policy is important because it eliminates conflicts of interest when we advocate for

new government policies or corporate practices. Our funding primarily comes from our members and donors, as well as from independent philanthropic foundations.

CSPI's Biotechnology Project addresses scientific concerns, government policies, and corporate practices pertaining to GE plants and animals that are released into the environment or that end up in our food. The project's goals are to:

- Educate policymakers, media, interested stakeholders, and the public about the benefits and risks associated with GE crops and animals;
- Advocate for strong, but not stifling, federal regulation to ensure safety to humans and the environment; and
- Provide expertise to help developing countries establish their own biosafety regulations and make science-based decisions about adopting GE crops.

CSPI has long advised consumers, journalists, and policymakers that foods and ingredients made from currently grown GE crops are safe to eat. That conclusion is consistent with those made by numerous international and scientific bodies, including the FDA, the National Academy of Sciences, the Food and Agriculture Organization, and others. The current GE crops also have provided tremendous benefits to farmers and the environment in both the U.S. and around the world. However, actions by developers selling GE seeds and by farmers growing GE crops have led to the highly troublesome development of insects and weeds that are resistant to widely-used pesticides. While GE crops could be used sustainably, instead some have been overused and misused, leading to environmental disruption and consumer opposition.

CSPI has advocated for improvements in the federal oversight of GE crops to ensure safety to humans, animals, the environment, and agriculture. Today, I will limit my testimony primarily to legislative changes that would significantly improve the federal government's oversight.

The Food and Drug Administration

By way of background, FDA is responsible for ensuring the safety of foods under the Federal Food, Drug and Cosmetic Act (FFDCA). Under that law, FDA has established a "voluntary consultation" process whereby developers of GE seeds may provide FDA with safety data to demonstrate that the GE crops are "substantially equivalent" to conventional, traditionally-bred counterparts. FDA set up that consultation process because it has held that GE crops are not "food additives," which undergo pre-market approval, but instead fall within the statute's category of foods that are "generally recognized as safe." The FDA believes that all commercially grown GE food crops have gone through the agency's voluntary consultation process. When the FDA consultation process is completed for a particular GE crop, FDA states in a letter to the crop's developer that FDA has *"no further questions"* about the developer's determination that the GE crop is substantially equivalent to its conventional counterpart. FDA never provides its own opinion or conclusion about the safety of that GE crop, and the crops are never formally approved.

CSPI believes that FDA *should* determine the safety of all GE food crops before foods from those crops enter our food supply. FDA should review the safety data submitted by the developer, conduct its own analysis of those data, and provide the developer and the public with its opinion of whether foods from that GE crop are safe to eat by humans and

animals. That new regulatory process would further ensure safety of future crops and allay consumer concerns about biotechnology. It is also consistent with the process by which most other countries ensure the food safety of GE crops.

While GE crop developers in the United States have always completed the consultation process, there is no guarantee that they will continue complying with the consultation process in the future. Similarly, it is unclear whether GE crop developers in India or China would consult with FDA, especially since they may be exporting finished food products. Therefore, CSPI has long-advocated that Congress pass legislation that would require an FDA pre-market approval process for all GE food crops.

CSPI believes that a mandatory pre-market approval by FDA should have the following four components:

- First, all engineered food crops, irrespective of their intended use (for instance, that would covers food crops such as amylase corn or food crops producing pharmaceuticals), should go through the approval process.
- Second, the mandatory approval process should be legally included in the FFDCA as opposed to being established in an agency policy that could be changed at any time.
- Third, after FDA has received public comments and completes it safety review, FDA must provide the developer and the public with its opinion about the GE crop's safety.
- Finally, until FDA determines that the GE crop meets the safety standard, it would be illegal to market foods or ingredients made from that crop (i.e., switching the burden of proof so the developer must prove safety to introduce a GE crop on the

market instead of the current situation whereby FDA is required to prove a GE food is unsafe to take it off the market). The safety standard would remain the "substantial equivalence" to conventionally bred crops that is currently used in the voluntary consultation process.

In addition to ensuring the safety of GE crops in the future, a mandatory approval process at FDA would also provide consumers with confidence that eating GE foods and ingredients is safe. Currently, critics of GE crops can— and do—state that, unlike in many other countries, FDA does not determine if a GE crop is safe. The Pew Research Center announced in early 2015 that while 88% of scientists who belong to the American Association for the Advancement of Science believe that foods from GE crops are safe, only 37% of U.S. adults believe they are safe.[1] An opinion on the safety of a GE crop by a reputable agency such as FDA would go a long way to alleviate consumers' safety concerns.

The United States Department of Agriculture

USDA regulates GE crops under its "plant pest" authority provided by the Plant Protection Act. Those provisions were not passed by Congress to regulate GE crops but are used because of the remote possibility that a GE crop could become a "plant pest." The USDA regulations require that GE crop developers either file a notification or obtain a permit to conduct field trials. Then, when the developer is ready to commercialize its engineered variety, the developer petitions USDA for nonregulated status, providing scientific evidence that the engineered variety is not a "plant pest" (that is, an organism

[1] Funk C, Rainie L. Public and Scientists' Views on Science and Society. Pew Research Center. (2015). *Available at:* http://www.pewinternet.org/2015/01/29/public-and-scientists-views-on-science-and-society/ . Accessed 10/19/2015.

that is harmful to plants or agriculture). To date, USDA has granted 117 petitions for nonregulated status and never once found a commercial GE crop that is a "plant pest" and requires continued oversight.[2] Developers and USDA spend significant resources determining that a GE crop is not a plant pest when they could use those resources to analyze and address real impacts from GE crops, such as development of resistant weeds and pests, or gene flow to wild relatives and non-GE farms. It is difficult to find any credible scientists who think adding one or two new genes to a domesticated crop would turn it into a "plant pest."

In the last few years, however, a large loophole has emerged that allows developers of GE crops to avoid USDA's lengthy and expensive regulatory process. If a GE plant variety is developed without using any components of a listed "plant pest," then USDA has no authority to regulate the GE crop, even its experimental field trials. Developers can avoid USDA oversight if they both use the "gene gun" as their method of transformation instead of agrobacterium (which is a "plant pest"), and design the DNA construct being introduced into the crop without using any sequences from "plant pests" (such as a promoter DNA sequence from cauliflower mosaic virus). USDA has confirmed numerous GE crops that have qualified for this exemption, and at any point in the future those experimental plants could become commercial products without any public announcement (unless those GE developers either submit to FDA's voluntary consultation process or include a Bt gene regulated by EPA as a pesticide). USDA's decision to exempt certain GE crops is not based

[2] United States Department of Agriculture Animal and Plant Health Inspection Service. Petitions for Determination of Nonregulated Status. *Available at:* https://www.aphis.usda.gov/biotechnology/petitions_table_pending.shtml. Accessed 10/19/2015.

on a scientific analysis that the particular GE crops are not risky and need no regulation, but instead the decision is solely because the crop is not captured by the narrow legal hook USDA uses to regulate. Such arbitrary and non-scientific decisions undermine the regulatory system and its reputation with the public in the United States and our trading partners abroad. It also could result in the release of a GE crop that might cause major harm to the environment or agricultural interests.

In 2008, USDA began a process to revise its regulations that might have added its "noxious weed" authority as additional legal authority that could subject some GE crops to oversight. A "noxious weed" is any plant or plant product that can directly or indirectly damage agricultural interests, public health, or the environment. An expansive interpretation of that definition could include a GE seed that results in herbicide-tolerant weeds. However, USDA interprets "noxious weed" narrowly, such that a crop that spurs the development of resistant weeds would not be a "noxious weed." Therefore, it is unlikely that USDA would find any GE crops would be "noxious weeds."

Congress should pass new legislation that would require USDA to regulate all GE crops, whether developed here or abroad, and ensure that the review addresses the real potential risks and impacts of those crops instead of expending resources addressing nonexistent "plant pest" risks. Such legislation could authorize USDA to issue permits for GE-crop field trials and issue licenses for GE seeds that are actually marketed. To obtain a permit or a license, GE crop developers would have to provide evidence that their crops would not adversely affect the environment or agricultural interests. USDA could weigh both the potential benefits and potential impacts of the GE crop as well as impose risk-

management conditions to limit any adverse impacts. License for commercialized seeds sold to farmers would allow USDA to impose post-market monitoring, such as collecting data on the development of resistant weeds or pests. Congress could also provide USDA with authority to exempt individual GE crops or groups of GE crops when their risk profiles did not require oversight. An advantage of such regulatory oversight is that no GE crops would avoid regulation, except when scientifically justified.

The Environmental Protection Agency

The Federal Fungicide, Insecticide and Rodenticide Act (FIFRA) requires EPA to register all pesticides sold in the United States. More than twenty years ago, EPA promulgated a regulation under FIFRA that established how it would regulate GE crops that had been engineered to produce a biological pesticide (such as the Bt-corn and Bt-cotton varieties currently on the market). Those plant-incorporated protectants (PIPs) are assessed in a mandatory review for impacts on the environment and human health. EPA also determines if any tolerance level is needed for the residues of the pesticide on food products derived from the crops. EPA's registration process helps ensure that any PIP will not result in unreasonable risk to human health or the environment when used appropriately.

While EPA's oversight of GE crops with PIPs has been better than the oversight of GE crops by both FDA and USDA, EPA has had to creatively interpret its current statutory language to manage the most likely environmental impact that could result from GE crops -- the development of resistant insects and weeds. For example, when EPA registered the Bt corn products, it had to determine that Bt toxins were a "public good" in order to impose

"insect resistance management" (IRM) obligations as part of their registration. (IRM is a series of actions that farmers need to take to delay the development of resistant insects.) EPA determined that it needed to protect the Bt toxins for both future farmers and organic farmers because it is a relatively benign pesticide in comparison to what it replaces. EPA's decision to include IRM was the first time EPA interpreted FIFRA to allow restrictions to prevent resistance (as opposed to setting forth restrictions to protect harm to non-target organisms or environmental impacts to soil, water, etc...).

While CSPI supports EPA's interpretation of its legal authority to allow for pesticide-use restrictions to prevent development of resistant insects or weeds, the relative novelty of EPA's position requires it to negotiate with the different seed developers exactly what resistance management obligations to impose, instead of just imposing them. If Congress would clarify that developing of resistant pests or weeds is an environment impact that EPA should manage under FIFRA (for both PIPs and conventional pesticides), EPA could impose necessary scientifically-sound conditions regardless of whether the registrants agree to them. It would also ensure that EPA actions is this area are required and not subject to the EPA's discretion.

This issue is relevant today because EPA currently is negotiating with the developers of Bt corn to impose additional use conditions on Bt corn rootworm PIPs to arrest the spread of resistant corn rootworms. An EPA Science Advisory Panel determined that actions to arrest Bt corn rootworm resistance include eliminating the use of soil insecticides in fields planted with Bt corn rootworm seeds as well as rotating the crops grown in the field. The evidence shows that the use of soil insecticides does not increase a

farmer's yield but instead masks the presence of resistant pests (which could multiply and spread resistance). With Congressional clarification that safety to the environment includes resistance management, EPA would be in a much better position to impose scientifically-sound restrictions on soil insecticide use.

An amendment to FIFRA would also allow EPA to prevent resistant weeds that develop when herbicides are used in conjunction with herbicide-tolerant GE seeds (as well as with all other uses of herbicides). Farmers in the U.S. have been using glyphosate-tolerant crops with glyphosate herbicide on hundreds of millions of acres over the past twenty years. Their overuse and misuse has resulted in 14 resistant weed species on more than 60 million acres of farmland. For the first time, EPA registered Dow AgroSciences' seeds that were engineered to be tolerant to both 2,4-D and glyphosate, and imposed some minimal resistance-management obligations on Dow and farmers. That was a good first step, but EPA needs to require additional actions to delay resistance (such as integrated weed management, rotation of herbicides with different modes of action, and rotation of crops), if it expects to protect existing herbicides for the next generation of farmers (no new herbicides with new modes of action are on the immediate horizon to replace herbicides that become ineffective). Clarifying that environmental impacts include resistance would greatly help EPA impose restrictions to prevent the development of resistant weeds.

H.R. 1599

Finally, CSPI understands that the Senate Agriculture Committee may look to the H.R. 1599—the Safe and Affordable Food Act—as a starting point for any introduced bill

surrounding GE crops. CSPI does not support the "Safe and Affordable Food Act" because it does not provide an adequate mechanism to ensure that the crops are safe. The convoluted regulatory process that H.R. 1599 establishes in order to make the FDA voluntary consultation process "mandatory" does not include the four necessary components discussed above that CSPI believes are needed in a scientifically-sound mandatory approval process.

TESTIMONY OF
WILLIAM JORDAN
DEPUTY DIRECTOR
OFFICE OF PESTICIDE PROGRAMS
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SENATE COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY

October 21, 2015

Good morning, Chairman Roberts, Ranking Member Stabenow, and other members of the committee. My name is William Jordan; I serve as the Deputy Director for Programs in the Office of Pesticide Programs at the U.S. Environmental Protection Agency. Thank you for the opportunity to testify about the agency's role in the federal government's Coordinated Framework for Regulation of Biotechnology, and the principles under which the EPA operates in its regulation of products of biotechnology.

The EPA is one of three regulatory agencies administering statutes used to regulate products of modern biotechnology, along with the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA). As described in the Coordinated Framework, the EPA regulates the sale and distribution of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure that pesticides are used in a way that is safe for humans and the environment. The EPA also regulates the safety of any residual amounts of a pesticide that occur in or on food by establishing maximum residue limits (called "tolerances") or tolerance exemptions under section 408 of the Federal Food, Drug and Cosmetic Act (FFDCA). The statutory definition of "pesticide" is broad, including any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, including, for example, insects, rodents and weeds. Modern biotechnology has been used to develop products that fall

under this definition, including substances with pesticidal properties genetically engineered into plants. The agency calls this type of pesticide a "plant-incorporated protectant" or "PIP."

The pesticide laws provide strong regulatory authorities and establish protective standards. Under FIFRA, every pesticide product, with some minor exceptions not applicable to PIPs, must be registered before being sold or distributed in the United States. To obtain a registration, an applicant must demonstrate to the agency's satisfaction that, among other things, the pesticide product will not cause "unreasonable adverse effects" on humans or the environment. If use of a pesticide is likely to result in residues in food, the EPA may establish a tolerance or an exemption for the residues only if the EPA finds there is "reasonable certainty that no harm will result" from exposure to residues of the pesticide in all foods, as well as all from other, non-occupational sources of exposure.

As the EPA regulates the products of modern biotechnology that fall within our jurisdiction, the agency is guided by several principles. Our decisions are based on the best available science; we operate with consistency and fairness in a transparent manner; and we collaborate fully with our regulatory partners in the Coordinated Framework.

Making regulatory decisions based on the best available science is the foundation of the EPA's decision making. The agency recognizes that it must be fully informed by the best available information and expert advice. To this end, the EPA generally requires applicants for registrations and tolerances to provide extensive data on their products. The EPA has a robust, well developed program for evaluating the information and data submitted to the agency to prove that a product meets the statutory standards for approval. For a PIP, an applicant typically must submit the following data: product composition, studies of potential allergenicity and toxicity to humans, studies of environmental fate and effects, and data and information used to develop

programs to manage the potential for resistance to a pesticide to emerge in the target pest population, called "resistance management" programs.

The agency seeks to ensure that the EPA staff have the training and experience to ensure a technically sound analysis and that the agency obtains the advice of leading technical experts as it makes major regulatory decisions and determinations. The EPA's staff includes experts trained in a variety of scientific disciplines who keep up with new knowledge in the various scientific disciplines important to understanding and evaluating the potential effects of biotechnology products. The EPA undertakes "horizon scanning" activities to ensure we are aware of and well prepared to evaluate new products efficiently and effectively. These include interaction with academic scientists through EPA-invitation presentations, webinars, grant review activities, and scientific meetings and conferences. Further, biotechnology companies in the process of developing new products routinely meet with the agency to describe products that may come to the EPA for registration. These meetings frequently include descriptions of any new technology, as well as the potential product. Information gleaned from these various sources informs the development of our assessment strategies for novel products as well as informing the assessment of individual products resulting from advances in scientific knowledge.

The EPA also seeks the advice of national experts in various scientific disciplines to inform agency scientists of the newest information emerging from laboratory research activities. One mechanism through which the EPA seeks such advice is the FIFRA Scientific Advisory Panel (SAP), a federally chartered advisory committee of external, independent experts, specialists in their fields, which the agency convenes regularly as its program for regulation of products of modern biotechnology evolves. Since the EPA first began evaluating the safety of PIPs, the EPA has held nearly two dozen SAP meetings focusing on such topics as data

requirements, how to assess potential allergenicity, how to assess risks to non-target insects, and how to predict and manage pest resistance.

The EPA believes we have a responsibility to convey to the public that our decisions are consistent, scientifically solid, and fully protective of human health and the environment. To this end, the EPA uses several mechanisms to increase transparency and solicit public input.

- For difficult scientific issues, we seek review by the SAP. Each meeting of the SAP is open to the public, and part of the meeting is reserved for the public to comment on the issues.
- The agency seeks public comment when it proposes to approve registration of a pesticide containing a new PIP, as well as when we are developing significant new policies affecting the products of modern biotechnology. The EPA provides public access to the documents concerning the proposed registration or policy by making them available in a docket open to the public. In addition, the agency addresses substantive comments and makes those written responses public along with its final action.
- The EPA's website provides general information to the public on its activities, including information on products of modern biotechnology. The website also provides guidance to developers for products subject to FIFRA and FFDCA section 408.

One of several principles laid out by the 1986 Coordinated Framework for Regulation of Biotechnology is that "agencies should operate their programs in an integrated and coordinated fashion and together should cover the full range of plants, animals, and microorganisms derived by the new genetic engineering techniques." The three regulatory agencies of the Coordinated Framework have attempted, through their regulatory actions, to cover the full range of products

derived by the new genetic engineering techniques, and the three agencies will continue to follow this principle.

The three regulatory agencies have operated their programs in an integrated and coordinated fashion over the last three decades. An example of this coordinated activity can be seen in the regulation of plants engineered to be tolerant of an herbicide. The USDA regulates the plant that has been modified to tolerate the herbicide. The EPA regulates the herbicide when used on such plants. The EPA has a well-developed approach to chemical risk assessment decisions, and it applies this approach to its evaluation of herbicides. The EPA and the USDA coordinate closely in their regulation of the herbicide and tolerant plant combination. For example, the EPA will not register the herbicide for use on the plant until the USDA completes its regulatory process for the engineered plant. When both agencies have reached a determination, the EPA and the USDA coordinate the announcement of their decisions.

The EPA also works closely with the FDA. The authority to establish tolerances or exemptions from the requirement of a tolerance for pesticide residues rests with the EPA under section 408 of the FFDCA. Other sections of FFDCA, administered by the FDA, are used in enforcement of the tolerances issued by the EPA. The EPA and the FDA work closely on all tolerance and tolerance exemption issues and do so for products of modern biotechnology, including for pesticidal substances engineered into a plant (PIPs).

In addition, under the Coordinated Framework, the EPA works with the FDA and the USDA, using our regulatory authorities appropriately to ensure the safety of products of modern biotechnology and, in general, sharing information. In some instances, the three agencies hold joint pre-submission meetings with technology developers in order to ensure that the companies are aware of the requirements of all three agencies. This type of activity smooths the regulatory

path for, in particular, small entities or individual researchers who may be less familiar with regulation by the federal government of products of modern biotechnology.

The EPA has issued eighty-six PIPs registrations. Most of these are for products that have introduced genetic material from the Bacillus thuringensis (Bt) microbe. Bt microbes produce a protein that is toxic to particular species of insects, and there is a broad scientific consensus that it has practically no effect on humans or other species. (Bt microbes, in fact, are approved as organic pesticides.) Growers have widely adopted PIP products in their farming operations. Today, more than 80 percent of the corn and cotton acreage in the United States, totaling nearly 100 million acres, is being planted with EPA approved varieties of PIPs. The EPA's experience with PIPs over the last 20 years is that such pesticides have been safe and generally have provided effective alternatives to conventional pesticides.

A number of groups – ranging from academicians to the federal government to the National Academy of Sciences – have studied how the introduction of PIPs has affected the use of synthetic chemical pesticides. These experts have concluded that by planting PIPs, growers have reduced by more than a third – many millions of pounds – their reliance on broad spectrum, synthetic insecticides. The result is reduced exposure to such pesticides for workers and non-target wildlife, less ground and surface water contamination by such pesticides, and less residue of such pesticides in food.

In addition, PIPs have been able to address pest problems that conventional chemical pesticides have not. For example, plum pox is a virus causing a devastating disease in stone fruits. While not endemic in the U.S., over the past few years plum pox has been detected in several locations in northeastern U.S. and Canada. The EPA has approved a PIP that, when introduced through a graft onto root stock, makes a tree able to successfully resist the disease.

This PIP provides a less expensive and more effective alternative to the traditional methods of controlling plum pox, which otherwise would require bulldozing and disposal of infected vegetation, quarantine surveys, and use of synthetic chemical pesticides to control the insects that spread the disease.

The use of PIPs in agriculture has already produced real benefits, and new PIPs hold promise for additional human health and environmental benefits. We cannot say, however, that future products of biotechnology would always be risk free, since by definition pesticides are intended to adversely affect some organism, even if only in a limited range. Therefore, before a new PIP is introduced into the environment, it is important that EPA have sufficient data and opportunity to evaluate the potential for risks to non-target organisms, and what, if any, species may be adversely affected.

In addition, controlling pest resistance to PIPs has long been, and will likely continue to be, a challenge. Experience has shown that target pests can, over time, develop mechanisms making them less susceptible to the effects of a pesticide. Widespread, repeated use of a PIP, or any other type of pesticide accelerates the pace at which pests develop resistance, and that has been an issue especially for Bt-based PIPs. Once resistance arises broadly in an insect population, that pesticide is no longer useful in controlling the population.

Because PIPs have proven to be effective and safer alternatives to conventional pesticides, EPA determined that use of PIPs, Bt PIPs in particular, should be managed in a way that should preserve the technology long into the future. In the case of Bt PIPs, following the guidance of nationally recognized experts, the agency has placed conditions on PIP registrations that reduce the possibility target insects could develop resistance to the PIP. The conditions require each farmer planting a Bt-based PIP to maintain a "refuge" of non-PIP plants that allows

populations of the target insect to develop without exposure to the Bt PIP. Each registrant must distribute grower guides that explain the resistance management requirements for the product and must conduct and report annually on the level of compliance. In addition, registrants must conduct annual resistance monitoring to assess changes in pest susceptibility and investigate cases of unexpected pest damage to PIP-containing crops. Altogether, these measures should slow the development of resistance.

In conclusion, the EPA recognizes the potential benefits that products created through modern biotechnology can bring to U.S. agriculture and the environment. At the same time we also believe that it is essential to have a strong, science based effective, and efficient regulatory system – one capable of responding to new technological developments in the field of modern biotechnology. We believe we have such a system at the EPA – a system that embodies the principles of sound science, transparency, and collaboration. Working with our colleagues at USDA and FDA, we look forward to continuing to fulfill our responsibility for ensuring the safety of the products of modern biotechnology.

I am happy to answer any questions.

Comments on Plant Biotechnology
Ronald Kleinman, M.D.

As a pediatrician, I know that food safety is critically important to moms and to children, and I am called upon to help parents understand facts and the fictions around food and nutrition, including GMOs. Plant biotechnology has been with us- safely- for 20 years. Not a single human illness or adverse effect has been documented. GM technology allows us to move a handful of carefully selected genes and traits among species and to achieve characteristics that conventional breeding will not permit. Commercial GM crops undergo testing and safety assessment that far exceeds the little-if-any testing of conventional varieties- despite the fact that GM technology is far more precise. Genes- DNA, RNA and resulting proteins- are part of every living thing and thus every whole food we consume. Undue concern regarding a few carefully selected genes makes no biological sense when considered against the hundreds of thousand of untested genes and gene products in the natural diet.

In my professional opinion, existing GM crops are safe based on the fundamental science of DNA, RNA, and protein in foods, upon extensive safety and compositional testing, and upon an extensive body of scientific studies- both short and long term. Our current system for the review and safety assessment of GM crops by FDA and EPA is robust and comprehensive- they are the most studied foods in history. The science and risk-based regulatory system we have in place is robust and provides a solid food safety and environmental affirmation to the American people. The nutritional value of GM crops is assured via extensive compositional testing. Food labeling on GM content conveys no useful nutrition or safety information to consumers, is often misleading, and will simply present confusing and confounding information to consumers, including the parents I personally advise.

Nutritional enhancement through GM technology is a reality. Globally, vitamin A deficiency afflicts millions of children annually with blindness, stunting, or death. That GM golden rice, which provides this essential nutrient, remains on the shelf is an incalculable tragedy. In the developed world, we know that adult heart disease has its origins in the diet of children. Existing, approved, but currently unavailable GM offerings for heart health include vegetable oils very low in saturated fats and plant-derived oils providing benefits of long chain fatty acids found mainly in fish, the latter being under-consumed, expensive, and in short supply.

Globally, we must sustainably feed a growing population while conserving limited land, water, and other resources. GM crops have resulted in dramatic reductions in chemical insecticide use, support conservation tillage to retain soils and conserve water, and reduce fuel use and carbon footprint. Traits in development include improved water and nitrogen utilization and enhanced yield which, in combination with breeding and hybrid technology, will be essential to providing ongoing food security. The next generation of insect control traits will include RNA-based control strategies which can control pests down to the genus and species level, limiting adverse environmental and health impacts.

Much of the recent controversy surrounding GM crops revolves around the concomitant use of glyphosate. Improved techniques allow detection of minute quantities of chemicals in body fluids- but presence does not equal risk. Measurement of glyphosate demonstrates that intakes in the general population are far below allowable daily intakes determined to be safe by the EPA and by similar agencies globally. Reports of glyphosate in breast milk have not been replicable using validated techniques. The recent opinion from the International Agency for Research on Cancer (IARC) that glyphosate is a probable human carcinogen is not supported by the data and flies in the face of comprehensive assessments from the US EPA, Japan, Australia, and other organizations with in WHO as well as the new EU safety assessment. Older allegations, suggesting that glyphosate and GMOs are somehow associated with food allergy, autism, and other medical conditions are unfounded speculation. Thus, concerns regarding glyphosate residues are unsupported and the fear-mongering surrounding them unjustifiable.

Despite the obesity problem, hunger remains a challenge in the US today, often driven by economic limitations and often afflicting the most vulnerable- children and the elderly. Sub-optimal nutrition remains common in adults- with excessive intakes of saturated fats and inadequate intakes of long chain omega-3 fatty acids. In the developing world, malnutrition and food security remain daunting challenges- highlighted by the recent mass displacements of refugees not seen since the Second World War. The malnourished child surviving to adulthood is saddled with life-long deficits in physical and cognitive ability, with lasting medical, social and economic impacts. For economically limited consumers and for small landholders around the globe who constitute the majority of GM crop farmers, improvements in disposable income invariably are invested back into the most valued resource of all- our children and the communities that support them.

Enhanced, sustainable food production is essential in both the developed and developing world. Advanced agricultural technology, including GM technology, is and will remain essential to meeting global production demands and to not just meeting, but optimizing global nutrition. This is essential not just for personal health, but for community health, global economic development, social order, and transnational security.

Statement of Joanna Lidback

The Farm at Wheeler Mountain
Westmore, Vermont

Member of Agri-Mark, Inc.

Member of the National Council of Farmer Cooperatives

Testimony before the Senate Committee on Agriculture, Nutrition and Forestry

Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives

October 21, 2015

Chairman Roberts, Ranking Member Stabenow, and other members of the Committee, thank you for inviting me here to talk about agriculture biotechnology. I am testifying on behalf of Agri-Mark Dairy Cooperative and the National Council of Farmer Cooperatives.

I did not grow up on a farm but got involved in agriculture through a 4-H dairy project as a young girl in 1989. Since then, I have not let go of my Jersey cows. I boarded my animals on neighboring farms and as fate would have it met a dairy farmer who I would eventually settle down with, bringing my Jerseys along. I have a bachelor's degree from Cornell University where I focused on agri-business management and a master's in business administration from the F.W. Olin School of Business at Babson College. Today, I live with my husband and our two farm boys on a 50-cow dairy in the beautiful Northeast Kingdom of Vermont. In addition to selling our milk to the co-op, we grow hay to sell, raise Jersey steers to process and sell beef locally, and we market a small amount of the composted manure. We farm about 200 acres of tillable land, including 50 acres of pasture where we graze our herd in temperate months. We also raise all of our own young stock.

In addition to being an active partner in the operation of our farm, I have a full-time job with a Farm Credit Association as a farm business consultant. I serve as first vice president of our County Farm Bureau, a director for the Vermont Jersey Breeders Association and as a dairy cattle judge for various youth and 4-H dairy shows across New England. I recently was appointed to the board of directors for an organization called the Truth About Trade & Technology, a non-profit advocacy group led by farmers who support free trade and farmers' freedom to choose the tools, technologies, and strategies they need to maximize productivity and profitability in a sustainable manner.

My husband and I are both proud to be first-generation farmers. Starting out on our own to build a dairy operation has been trying at times. But all the hard work we have endured could never outweigh the chance to raise our two young boys in a farming lifestyle, living on our family's land and caring for our animals while producing food for our corner of the world.

When we started building our operation, we knew that sustainability, including economic sustainability would be key in order to pass the farm along to our sons sometime down the road. We knew this would not be possible without diversifying our operation and using modern technology that would have a positive impact on our farm as well as the environment and community that surround us. My husband says, as a farmer, and a small farmer at that, we have so much working against us; we need to make use of things that will work for us.

Biotechnology crops are essential to sustaining our dairy. We feed our cows and calves biotech feed and when we can, we pasture feed our livestock. Harsh Northern New England weather makes this impossible for about six months out of the year so during that time, we feed cows and calves grass that we have processed into hay or grass silage. We also rely on both corn and soy

based feeds to complete a "total mixed ration" – one that balances the nutritional needs of our cattle with the protein and nutrients our forages provide.

This gives me a unique perspective on biotechnology. I believe that biotech varieties improve efficiency and productivity of farming in general. I also believe that biotechnology enables us to lessen the environmental impact that growing can have because less fertilizer and pesticides are used, which in turn means fewer times over the soil with equipment thereby cutting down on soil erosion and compaction as well as carbon footprint. Yields are typically higher and there are fewer weeds, growing a cleaner, more abundant crop.

The use of biotechnology on our farm is also important to the economic sustainability of our small business by keeping the price we pay for feed affordable. To compare prices, a Non-GMO basic 20 percent protein complete feed would cost $555 per ton; the same conventional feed that we purchase is currently $305 per ton. On our small farm, we purchase about 16 tons of grain per month. So, using 16 tons, that would increase our grain bill significantly, or in hard numbers we would spend $4,880 per month for our regular feed or $8,880 per month on non-GMO feed—a difference of $4,000 a month or $48,000 per year. I do not see how we could profitably farm in the long term with those increased feed costs, thus effectively pushing my small farm out of business.

It's also important to note that our feed company does not have the infrastructure to carry and store yet another type of grain based on growing method – they already carry organic grain, which is generally non-GMO already. This means that we would have to pay a higher freight cost to ship the non-GMO feed to our farm.

Farmers and society alike benefit from the use of biotechnology. A common argument I often hear against biotechnology is that it requires increased amounts of pesticide use. Actually, it's this very myth that launched me into better understanding genetic engineering and to speak up for my neighbors who use biotech seed for exactly the *opposite* reason – it lets them spray less pesticide. Through biotechnology, farmers have been able to decrease the amount of pesticide they use each crop season. According to the U.S. Department of Agriculture (USDA), overall pesticide usage in the U.S. peaked in 1982 and has been trending downward since. In fact, the introduction of biotech crops has accounted for a reduction of 2.5 million pounds of pesticide usage a year in the United States alone. Furthermore, only nine percent of corn farmers used insecticides on their crops in 2010. A study from the Economic Research Service at USDA conducted in February of last year shows insecticide use on corn farms declined from 0.21 pounds per planted acre in 1995 to 0.02 pounds in 2010. This is a 90.5 percent reduction.

Biotechnology goes hand in hand with other practices allowing farmers to tailor their particular growing method to best suit their resources and soil requirements. For example, many farms in my area choose to do no-till cropping, which allows farmers to plant corn or other crops without

tilling the land. This assists in the reduction of soil compaction and soil erosion. Several farmers are also using cover crops in my area despite the short growing season. Cover crops help to rebuild soil health and rebuild soil organic matter. Precision agriculture, which is on the horizon for more widespread use, offers even more opportunity to pinpoint areas in need of control media or pesticides thereby further reducing the amount used and sprayed on the land.

Beyond improved yields, fewer chemicals and reduced carbon footprints, agriculture has made many other advances through biotechnology over the years. This level of genetic engineering has sped up traditional plant breeding, making it more efficient and resource-effective. Biotechnology has brought us even more solutions for things like drought tolerance (DroughtGard corn launched in 2013), improved nutrition (Vitamin A and Golden Rice), disease resistance (Rainbow Papayas and the Ringspot Virus in Hawaii) and medical advancement (Diabetes and Genetically Engineered Insulin), to name a few. It also could help us answer other issues such as Citrus Greening, American Chestnut tree blight, and maybe even human diseases like Ebola.

I am disappointed that my home state of Vermont passed a mandatory GMO-labeling law that is set to take effect next year. The main argument pushing for passage of this bill was this idea that consumers have a right to know what is in their food. In my opinion, the Vermont law does not offer anything to better inform consumers about what is in their food but instead serves as a warning. I find the law to be frustrating and full of contradictions. For example, it applies to packaged and processed foods, but not if they contain meat. Thus a can of vegetable soup would carry a label but that same soup with added meat would not. Food in restaurants is exempted, thus a pizza in a store might require a label but a delivery pizza would not. At this time, dairy is also exempted, but my worry is that over time these odd exclusions would fall away.

Besides, I believe there are better uses of the state's time and taxpayer resources than imposing regulations on a technology that has been used commercially and proven safe for over two decades. I am also concerned about the impact this law will have on the cost and availability of food in Vermont's grocery stores, and whether or not food companies will decide to simply not ship food to the state because of the laws nonsensical labeling requirements. Our farm is not too far from the border with New Hampshire; we can get there in under an hour. No doubt there will be consumer confusion over having one label on food in Vermont, and another on the exact same products in New Hampshire and the rest of the country. This serves no one's interests—not consumers, not farmers, not food producers.

We also now have a better idea for what the costs will be with mandatory GMO labels. Costs will be incurred all the way down the value chain given new requirements for segregating crops for now a third growing method, adding non-GMO to GMO and organic. Currently this process is being driven by demand in the marketplace as it rises and over the past couple of years, the popularity of non-GMO products has grown significantly. These consumers choose to buy these

products despite the scientific consensus that supports the safety of GMOs. Conversely, with mandatory GMO labels, the costs of food in the grocery store will go up for everyone. A study out of Cornell University estimates an increase of about $500 per family of four per year – that's the equivalent of an apple a day for a year. That may not seem like a whole lot at almost $10 per week, but the burden of this increase would be felt by those who could least afford it – people in my own community. Eighty percent of the children in our local elementary school qualify for free or reduced-price lunch already. These are the families who would be hardest hit for no good reason.

Government mandated labeling of GMOs perpetuates an unnecessary fear. People have a right to know what is in their food, but that does not equate to a mandated label, particularly as food from GMO crops do not pose any additional food safety or human health threat than non-GMO or organic crops. The Food and Drug Administration (FDA) requires the labeling of anything about a product that affects health and safety or nutrition. Since the introduction of biotech crops to the general public in 1994 (i.e. the Flavr Savr Tomato), there has not been one documented case of associated illness. A review of 1,783 studies completed between 2002 to 2012 by a team of Italian scientists published in the September 2013 *Critical Reviews in Biotechnology* could not find a single example of biotech crops posing a threat to humans, animals or the environment. Further, a study released by a University of California, Davis geneticist in September 2014 reviewed 29 years of feeding animals from a period before GMO-feeds were introduced for animal feed and after (1996). The *Journal of Animal Science* article covered over 100 billion animals including examining animals pre- and post-mortem. They found no indication of any unusual trends, and concluded that GMO-feed is at least the equivalent and as safe as non-GMO counterparts.

I know a lot of organic farmers and now, some non-GMO farmers. Many are even great friends. And while I respect their decision to farm the way they choose, I personally do not agree with all of their practices, just as I am sure the pendulum swings both ways. I do know that we all care for our animals and our land to the best that we can and that alone builds a level of commonality. Trouble comes when the people using labels and loose advertising to sell products for their food company pit us against each other.

As a mother and a consumer, I do not purchase organic or non-GMO food in the store. I will support my local community, however, and may purchase organic or non-GMO food at a farmers' market, directly at a farm stand or a local product in the store. I generally do not believe in paying the higher premium for these foods because they provide no added nutritional or other health benefits and environmental benefits are arguable. With a growing family and a growing farm business, we have lots of other places to spend our hard-earned money. Furthermore, I feel secure in the steps that have been taken by the FDA and USDA to ensure the food produced and available for sale in the grocery store is safe to feed my family.

I personally believe that there is room for many different styles of farming. I also believe that biotechnology plays a major role in our collective ability to not only feed a growing global population, but to also make individual improvements on our own farms be it 50 cows or 5,000 cows; a cash crop operation or an apple orchard; a multiple-generation farm or a beginning farmer. Even though less than two percent of the U.S. population now lives on farms or is actively involved in farming, agriculture comes in all different sizes and shapes.

The fact is that American farmers offer consumers more food choices than ever before. Of course, living and working on a farm and being exposed to farm publications and reports, I may have a more intimate knowledge about the way food is grown than the typical mom. That's not to say that the average consumer does not have a right to a better understanding of how the food they purchase is grown. The information is readily available. It's just a matter of getting it from reliable sources.

Moreover, I feel even better knowing that food produced with ingredients derived from biotechnology has been done so with some sort of advantage in mind – whether it's environmental, health or otherwise. I do not believe a mandatory GMO label is necessary; in fact I think there are more responsible ways to spend [my] taxpayer monies. Be that as it is, if consumers are to drive some sort of label requirement I believe it should be done in a voluntary and cohesive way at the federal level. Again, I do not believe those consumers who can least afford increased costs at the grocery store should have to bear the burden for a small percentage of consumers who are pushing for mandatory labeling.

I am happy to continue to speak up for our right to farm in the best way we know possible; which in our case includes the use of biotechnology. I will continue to pursue an active presence on Facebook, Twitter and Instagram as well as more traditional communication routes via newspapers, church meetings or everyday conversation, sharing articles and ideas along with my knowledge about the opportunities and challenges we face as modern-day farmers and parents. If I have just one person reach out to me following my statement today, to ask about my perspective from the farm, then I will have succeeded.

We know more now than ever about growing food, or caring for animals, and this helps us to achieve a level of productivity that previous generations of farmers would envy. I am proud of how far the American farmer has come, just as I am proud of how far we have come on our own farm. I look forward to the day when our boys are grown and tell us they are ready to take over. I know they will carry the values my husband and I instill in them to be good stewards of our land, animals and community, and I hope they still have the ability to use the latest tools and technology to help them do so.

Thank you again for the opportunity to be here today and to share my experience with agricultural biotechnology.

About Agri-Mark

Agri-Mark, with $952 million in 2013 sales, markets more than 300 million gallons of farm fresh milk each year for more than 1,200 dairy farm families in New England and New York. The cooperative is headquartered in Methuen, Mass., has been marketing milk for dairy farmers since 1913, and actively represents their legislative interests in the Northeast and in Washington, D.C.

Agri-Mark owns three cheese and dairy product manufacturing facilities in Vermont and New York State and has a butter/nonfat powder plant in Massachusetts. Agri-Mark has also invested in operations to manufacture and market valuable whey proteins globally while also marketing fresh fluid milk from its local farm families to the region's largest dairy processors.

About the National Council of Farmer Cooperatives

Since 1929, NCFC has been the voice of America's farmer cooperatives. NCFC values farmer ownership and control in the production and distribution chain; the economic viability of farmers and the businesses they own; and vibrant rural communities. We have an extremely diverse membership, which we view as one of our sources of strength—our members span the country, supply nearly every agricultural input imaginable, provide credit and related financial services (including export financing), and market a wide range of commodities and value-added products.

American agriculture is a modern-day success story. America's farmers produce the world's safest, most abundant food supply for consumers at prices far lower than the world average. Farmer cooperatives are an important part of the success of American agriculture. Cooperatives differ from other businesses because they are member-owned and are operated for the shared benefit of their members.

Farmer cooperatives enhance competition in the agricultural marketplace by acting as bargaining agents for their member' products; providing market intelligence and pricing information; providing competitively priced farming supplies; and vertically integrating their members' production and processing. There are over 3,000 farmer cooperatives across the U.S., and earnings from their activities (known as patronage) are returned to their farmer members, helping improve their members' income from the marketplace.

DEPARTMENT OF HEALTH AND HUMAN SERVICES Public Health Service

Food and Drug Administration
Silver Spring, MD 20993

STATEMENT OF

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CENTER FOR FOOD SAFETY AND APPLIED NUTRITION

FOOD AND DRUG ADMINISTRATION

DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY

UNITED STATES SENATE

October 21, 2015

FOR RELEASE ONLY UPON DELIVERY

Good morning, Chairman Roberts, Ranking Member Stabenow, and members of the Committee. I am Dr. Susan Mayne, Director of the Center for Food Safety and Applied Nutrition at the Food and Drug Administration (FDA or the Agency), which is part of the Department of Health and Human Services (HHS). Thank you for the opportunity to be here today to discuss FDA's regulatory program for foods derived from genetically engineered (GE) sources.[1]

Over the last 20 years, FDA has reviewed and evaluated data and information on more than 150 GE plant-derived foods, ranging from herbicide-tolerant soybeans to canola oil with a modified fatty acid profile. In a 1992 policy statement on foods derived from new plant varieties (including GE plant varieties), FDA stated that the Agency was not aware of any information showing that foods derived by these methods (i.e., genetic engineering) differ from other foods in any meaningful or uniform way or that, as a class, foods developed by the new techniques present any different or greater safety concern than foods developed by traditional plant breeding. This 1992 statement and its scientific underpinnings still reflect FDA's current thinking about foods derived from GE plants and, based on our evaluations, we are confident that foods from genetically engineered sources in the U.S. marketplace today are as safe as their conventional counterparts.

BACKGROUND

The selection and genetic improvement of plants for agricultural use has been going on for

[1] Foods derived from genetically engineered sources are also referred to as biotech, bioengineered, and genetically modified (GM) foods. Because from a scientific perspective, the term "genetic modification" means the alteration of the genotype of an organism using any technique, new or traditional, and therefore also encompasses plants altered through methods such as conventional breeding and selection, FDA uses the term "genetically engineered," or "GE," to distinguish organisms that have been modified using genetic engineering (also known as modern biotechnology) from those modified through traditional breeding.

thousands of years, although plant breeding as a science only began in the late 1800s. Typically, plant breeding has involved crossbreeding and hybridization, in which two related plants are cross-fertilized, and the resulting offspring have characteristics of both parent plants. In the breeding process, however, many undesirable traits often can appear in addition to the desirable ones. Some of those undesirable traits can be eliminated through additional breeding, which is time-consuming. Breeders can then further select and reproduce the offspring that have the desired traits. Many of the foods that are already common in our diet are obtained from plant varieties that were developed using conventional genetic techniques of breeding and selection. Hybrid corn, nectarines (which could be considered genetically altered peaches), and tangelos (a genetic hybrid of a tangerine and grapefruit) are all examples of such breeding and selection.

Today, by inserting one or more specific genes into a plant, scientists are able to produce a plant with new characteristics. These techniques give scientists the ability to isolate specific genes of interest and introduce them and their corresponding traits into plants without simultaneously introducing undesirable genes and traits. This can reduce the time-consuming process of breeding out undesired genes and traits when developing a new variety. Genetic engineering also expands the range of new proteins and other substances that can be introduced into plants.

Any genetic modification technique, including both conventional methods and genetic engineering, could change the composition of a food in a manner relevant to food safety. However, FDA has well-established scientific procedures for evaluating the safety of such new substances, and our guidelines help developers identify these issues and address such concerns prior to marketing. It is important to note that the kinds of testing typically conducted by

developers of a GE food crop to ensure that their foods meet applicable requirements of the Federal Food, Drug, and Cosmetic Act (FD&C Act) also address food safety concerns. This testing provides a way to detect undesirable traits at the developmental stage and defer marketing until any concerns are resolved. FDA expects developers of foods derived from GE plants to analyze the composition of the foods from their new crop varieties to ensure that any changes compared to the food's conventionally derived counterpart are appropriately considered and addressed before marketing such foods.

As part of our review and analysis, we consider whether any newly introduced protein is likely to be allergenic or toxic and whether levels of important nutrients or anti-nutrients have been changed in a way that is relevant to food safety or nutrition. We also consider whether any newly introduced protein requires premarket approval as a food additive. Later in my testimony, I will describe the Agency's rigorous premarket consultation process and discuss in more detail how it helps us ensure the safety of foods derived from GE plants.

COORDINATED FRAMEWORK FOR THE REGULATION OF BIOTECHNOLOGY

FDA regulates foods from GE sources in conjunction with the U.S. Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) under the Coordinated Framework for the Regulation of Biotechnology (Coordinated Framework), adopted by the agencies in 1986[2] and updated in 1992.[3] The Coordinated Framework provides a comprehensive Federal regulatory policy for ensuring the safety of biotechnology products. While the current

[2] 51 FR 23302, June 26, 1986

[3] 57 FR 6753, February 27, 1992

regulatory system for biotechnology products effectively protects health and the environment, advances in science and technology since 1992 have altered the product landscape. In addition, the complexity of the array of regulations and guidance documents developed by the three primary Federal agencies with jurisdiction over biotechnology products can make it difficult for the public to understand how the safety of biotechnology products is evaluated, and navigating the regulatory process for these products can be challenging, especially for small companies.

In light of these circumstances, on July 2, 2015, the Executive Office of the President (EOP) issued a Memorandum to FDA, EPA and USDA on modernizing the regulatory system for biotechnology products. The EOP Memorandum directs the agencies to implement certain specified activities, both in the near term and long term, including:

1. Establish an inter-agency biotechnology working group that includes representatives from EPA, FDA, USDA, and the EOP. The working group will implement activities identified below and will prepare an annual report of its activities for public dissemination.
2. Update the Coordinated Framework to clarify current roles and responsibilities of the agencies that regulate the products of biotechnology, after input from the public.
3. Develop a long-term strategy to ensure that the Federal regulatory system is equipped to assess the safety of future biotechnology products, to include a plan for periodic horizon-scanning assessments of new biotechnology products; identify any needed changes to authorities, regulations, or policies necessary to improve the agencies' abilities to assess potential risks; and increase transparency and streamline their

regulatory processes.

4. Conduct external independent assessments every five years to identify future products of biotechnology and to evaluate whether such products pose new risks.

Efforts are underway to implement the activities described in the memorandum. Subsequent to the issuance of the EOP Memorandum, an inter-agency working group, with representatives from the EPA, FDA, USDA, and the EOP, has been established within the Emerging Technologies Interagency Policy Coordination Committee to implement the activities described in the EOP Memorandum.

Under the auspices of the National Science and Technology Council, this interagency group issued a Request for Information (RFI) in the *Federal Register* to solicit data and information, including case studies, that can inform the development of the proposed update to the Coordinated Framework and the development of a long-term strategy consistent with the objectives described in the EOP Memorandum.[4]

FDA is hosting the first of three public meetings to be held across the country as part of the effort described in the EOP Memorandum. Under the auspices of the National Science and Technology Council, the FDA, along with the Office of Science and Technology Policy, EPA, and USDA, is holding this meeting to inform the public about the activities described in the EOP Memorandum; invite oral comments from interested parties; and provide information about how to submit written comments, data, or other information to the docket. This first public

[4] 80 FR 60414, October 6, 2015

meeting will be held on October 30, 2015, at the FDA campus in Silver Spring, Maryland. Information received at and after this public meeting and in response to the RFI will be used by FDA and others in the inter-agency working group as we update the Coordinated Framework and develop the long-term strategy.

We are committed to and look forward to working with the EOP, USDA, and EPA to implement the activities described in the EOP Memorandum. The Agency anticipates that this effort will further enhance the transparency and predictability of FDA's existing regulatory processes.

FDA'S LEGAL AND REGULATORY FRAMEWORK PERTAINING TO FOODS DERIVED FROM GE PLANTS

FDA regulates the safety of foods, including foods derived from GE plants, under the FD&C Act and other applicable laws and regulations. Under the FD&C Act, FDA is also responsible for enforcement with respect to unlawful pesticide chemical residues in foods. Foods, such as fruits, vegetables, grains, and their byproducts, derived from plant varieties developed through genetic engineering, are subject to the same safety and labeling requirements as foods derived from non-GE plants. The Agency has broad authority to initiate regulatory action if a product fails to meet the requirements of the FD&C Act, as discussed in more detail below. FDA relies primarily on two sections of the FD&C Act to ensure the safety of foods and food ingredients, including those that are produced using genetic engineering:

The adulteration provisions of section 402(a)(1) [21 U.S.C. 342(a)(1)]. Under this post-market authority, FDA has the power to remove a food from the market (or sanction those marketing the food) if the food poses a risk to public health. It is important to note that the FD&C Act places a

legal duty on developers, manufacturers, and distributors to ensure that the foods they market to consumers are safe and comply with all legal requirements.

The food additive provisions of section 409 [21 U.S.C. 348]. Under this section, a substance that is intentionally added to food is a food additive, unless the substance is generally recognized as safe (GRAS) or is otherwise excluded (e.g., a pesticide, the safety of which is overseen by EPA). The FD&C Act requires premarket approval of any food additive, regardless of the technique used to add it to food. Use of an unapproved food additive renders the food unsafe and subject to the adulteration provisions in 402(a)(2)(C) of the FD&C Act.

FDA's *Statement of Policy: Foods Derived from New Plant Varieties*[5] explains how existing legal requirements apply to plant-derived food products developed using the tools of biotechnology. The policy was designed to answer questions about these products and to assist developers, prior to marketing, to meet their legal duty to provide safe and wholesome foods to consumers. The basic principle of the policy is that the traits and characteristics of the foods should be the focus of safety assessment for all new varieties of food crops, no matter which techniques are used to develop them.

Under FDA policy, a substance that would be a food additive if it were added during traditional food manufacturing is also treated as a food additive if it is introduced into food through genetic engineering of a food crop. Section 409 requires premarket approval of any food additive and, thus, requires premarket approval of any substance intentionally introduced via genetic

[5] 57 FR 22984, May 29, 1992, accessible at *http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Biotechnology/ucm096095.htm*

engineering that is not GRAS.

Examples of substances intentionally introduced into food that would not be considered GRAS and, therefore, would be reviewed as food additives include those that have unusual chemical functions, have unknown toxicity, or would be new major dietary components of the food. In general, substances intentionally added to or modified in food via genetic engineering to date have been proteins and fats that are, with respect to safety, similar to other proteins and fats that are commonly and safely consumed in the diet. Therefore, these substances have not been subject to the food additive approval process. In our experience with foods derived from GE plants to date, we have approved only one substance as a food additive for human consumption—an enzyme produced by an antibiotic resistance gene (kanamycin). Under the food additive approval proeess for use in animal food, we have approved the use of two substances (kanamycin and gamma linolenic acid), and another is currently under review.

VOLUNTARY PREMARKET CONSULTATION PROCESS

Food growers, manufacturers, and distributors are responsible for taking the steps necessary to ensure that their food products marketed in the United States are safe. To help developers of foods derived from GE plants comply with their obligations under the FD&C Act and FDA regulations, the Agency encourages them to participate in a voluntary consultation process with FDA prior to commercial distribution. The goal of the voluntary premarket consultation process is to ensure that any safety or other regulatory issues associated with food from the new plant variety are resolved *prior* to commercial distribution. Although the premarket consultation is voluntary, in our experience, most developers utilize this pathway. FDA also retains the

authority to regulate and ensure the safety of foods derived from new plant varieties under existing adulteration and misbranding provisions of the FD&C Act.

The results of FDA's consultations are public information and are available on the Agency's website. Since the consultation process was created, developers of GE plants (which include private companies, academic institutions, and government agencies) have completed the process more than 100 times as they sought to introduce plants representing more than 150 different crop varieties into the U.S. market. These evaluations have included varieties of potato, apple, soybean, corn, cotton, canola, papaya, alfalfa, creeping bent grass, plum, sugar beet, wheat, rice, cantaloupe, flax, squash, and radicchio, with traits such as herbicide tolerance, insect resistance, virus resistance, altered ripening, altered nutritional profiles, altered plant fertility, and altered plant growth properties, and resistance to browning. Where the traits are pesticidal, FDA directs developers to work with EPA, which evaluates the safety of pesticides and sets tolerances for their presence in food, which are then enforced by FDA.

Typically, the consultation begins early in the product development stage, well before it is ready for market. Developers meet with FDA scientists to describe the product they are developing. In response, the Agency advises the company on what tests would be appropriate for the developer to assess the safety of the new food.

After the studies are completed, a summary of the data and information on the safety and nutritional assessment are provided to FDA for review. The Agency evaluates the information for all relevant food safety hazards, including potential unintended effects on plant composition

and nutritional properties, since plants may undergo changes other than those intended by the developers. For example, FDA scientists evaluate data and information to ensure that the newly expressed compounds are safe for food consumption and that there are no allergens new to the food, no increased levels of natural toxicants or anti-nutrients, and no reduction of important nutrients.

The safety assessment approach FDA applies during its evaluation of consultation submissions is consistent with the approach laid out in the Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants (CAC/GL 45-2003), established by the Codex Alimentarius Commission, a food standard-setting body established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO).

Some examples of the information evaluated by FDA include:

- The name of the food and the crop from which it is derived;
- The uses of the food, including both human food and animal feed uses;
- The sources, identities, and functions of introduced genetic material and its stability in the plant;
- The purpose or intended technical effect of the modification and its expected effect on the composition and characteristic properties of the food or feed;
- The identity and function of any new substances introduced by the genetic material, including an estimate of its concentration;
- A comparison of the composition and/or characteristics of food derived from the GE

plant variety to that of food derived from the parental variety or other commonly consumed varieties with special emphasis on important nutrients, anti-nutrients, and toxicants that occur naturally in the food;

- Information on whether the genetic modification altered the potential for the food derived from the GE plant variety to induce an allergic response; and
- Other information relevant to the safety and nutritional assessment of the food derived from the GE plant variety.

These examples are not meant to be exhaustive, but are sufficiently broad so as to provide FDA with an indication of any safety or other regulatory issues that may require additional investigation. This flexibility allows FDA's consultation program to ask the necessary questions to understand any uncertainties that may exist concerning safety or other attributes of the food in order to ensure the safety and lawfulness of food from a new plant variety.

If FDA scientists have questions about the safety data, the developer may, for example, provide more detailed answers or conduct additional studies. Participation in the process is voluntary, although as previously noted, most, if not all, developers participate in this process and it provides for a rigorous food safety evaluation. It is common for FDA to request additional data and information or clarification about the data and information submitted by the developer. This iterative process makes for a rigorous safety evaluation. FDA considers a consultation to be complete only after all safety and other legal issues have been resolved. The final consultation phase and review of the firm's safety assessment generally takes 1-2 years, depending on the complexity of the consultation. The premarket consultation process is working well and protects

public health by helping FDA ensure that firms are making market-entry decisions in compliance with the law.

LABELING OF FOODS DERIVED FROM GE SOURCES

FDA also regulates the labeling of food under the FD&C Act. Section 403 of the Act [21 U.S.C. 343] sets forth labeling requirements for foods subject to the FD&C Act. In general, all foods, whether produced using genetic engineering or not, are subject to these labeling requirements. Section 403(a)(1) establishes that a food is misbranded if its labeling is false or misleading in any particular. Section 201(n) provides, in relevant part, that labeling is misleading if, among other things, it fails to reveal facts that are material in light of representations made or suggested in the labeling, or material with respect to consequences that may result from the use of the food under the conditions of use prescribed in the labeling, or under such conditions of use as are customary or usual.

In its 1992 Policy Statement, FDA explained that it found no basis to conclude that foods derived from new plant varieties developed using genetic engineering techniques, as a class, differ from other foods in any meaningful or uniform way or pose any different or greater safety concern than foods developed by traditional plant breeding. Therefore, the use of genetic engineering in the development of a food is normally not, by itself, material information within the meaning of section 201(n) of the FD&C Act. Scientific studies, information, and data FDA has reviewed since then, including data and information evaluated through the voluntary premarket biotechnology consultation process, reflects the same conclusion.

As set forth in the 1992 Policy, absent a material fact or difference in a food derived from a GE source, sections 403(a)(1) and 201(n) of the FD&C Act do not require additional labeling indicating that the food has been developed through genetic engineering. Federal courts have held that this interpretation of sections 403(a)(1) and 201(n) of the FD&C Act is entitled to deference. Further, courts have held that consumer desire to know such information is not, by itself, sufficient to require such labeling. FDA may require additional labeling for foods derived from GE sources, just as we would for non-GE foods that have been genetically modified through conventional methods such as plant breeding, when the genetic change results in a material difference in the food, such as a difference in nutritional content of the food (e.g., altered fatty acid profile) or a difference in functional characteristics of the food (e.g., suitability for frying). In general, it is the difference (e.g., not suitable for frying) and not the fact that the product was produced using genetic engineering that must be disclosed in the labeling. For example, oil from genetically engineered soybeans with increased levels of oleic acid is required to be labeled "high oleic soybean oil" so that consumers know that the nutritional properties of the oil are different from those of traditional soybean oil. We note that the Agency has received two Citizen Petitions regarding the labeling of genetically engineered foods. We are currently reviewing those petitions and considering the issues presented.

We recognize and appreciate that many consumers are interested in knowing whether their food is produced using genetic engineering. Currently, food manufacturers may indicate through voluntary labeling whether foods have or have not been developed through genetic engineering, provided that such labeling is truthful and not misleading. The Agency is supportive of such voluntary labeling and, in 2001, issued draft guidance to industry to help food manufacturers

who wish to voluntarily provide such information in food labeling to help ensure that such labeling is truthful and not misleading. FDA received more than 155,000 comments on the draft guidance. The Agency has considered the comments we received and is currently revising the draft guidance with the goal of publishing a final guidance document to assist food manufacturers who want to provide such labeling statements.

GE ANIMALS

FDA regulates GE animals under the new animal drug provisions of the FD&C Act and the Agency's implementing regulations. Because the genetic material, or recombinant DNA (rDNA) construct as integrated into the DNA of the target animal is intended to affect the structure or function of that animal, the rDNA construct meets the definition of a drug under the FD&C Act. The new animal drug approval process provides a rigorous review for such products.

The FD&C Act generally requires sponsors to demonstrate the safety and effectiveness of a new animal drug for the proposed conditions of its use prior to marketing. For new animal drugs that are intended for use in food-producing animals, FDA's evaluation of safety includes not only an evaluation of target animal safety, but also an evaluation of food safety. In addition, FDA must comply with the requirements of the National Environmental Policy Act prior to taking any actions, such as approval of an application.

In January 2009, FDA issued a final guidance for industry on the regulation of GE animals. The guidance explains the process by which FDA is regulating GE animals and provides a set of recommendations to help producers of GE animals meet their responsibilities under the law.

As the company has publicly noted, FDA is currently reviewing a new animal drug application related to AquAdvantage Salmon, an Atlantic salmon developed by AquaBounty Technologies, Inc., which is genetically engineered to reach market size more quickly than its non-GE counterpart. In December 2012, the Agency made its draft environmental assessment (EA) and a preliminary finding of no significant impact (FONSI) available for public comment. The draft EA and preliminary FONSI are the Agency's initial assessment of the potential impacts of the proposed product on the environment of the United States under the specific conditions proposed by the sponsor. FDA received over 35,000 comments on the draft EA and preliminary FONSI. We are reviewing these comments in order to determine whether any changes in the draft EA or additional analysis are warranted.

On September 19-20, 2010, the Agency held a public meeting of its Veterinary Medicine Advisory Committee (VMAC), a former body comprised of independent outside experts who advised FDA on scientific, technical, and policy matters, to discuss AquAdvantage Salmon. The presentations made by Agency experts, the transcript of that meeting, the Chair's report, and VMAC documents containing detailed information on the review process are all posted on FDA's website for public review. At the public meeting, the Agency did not indicate any preliminary views or determination on the product application. It did, on the safety question, provide a preliminary indication, noting that based on the data and information available at that time, food from AquAdvantage Salmon appears to be as safe to eat as non-GE farm-raised Atlantic salmon. FDA will make a final food safety determination before reaching any final decision on whether to approve the new animal drug application for AquAdvantage Salmon.

We also note that in the event that the new animal drug application for this product is approved the Agency will provide information to the public regarding any labeling of food from AquAdvantage Salmon.

CONCLUSION

FDA's voluntary premarket consultation process provides for a rigorous food safety evaluation foods derived from GE plants. As a result of these premarket consultations, we are confident that foods derived from GE plants in the U.S. marketplace today are as safe as their conventional counterparts. The Agency, in cooperation with EPA and USDA, will continue its oversight of new and emerging foods produced using genetic engineering and will be vigilant in ensuring the safety and integrity of the food supply.

Thank you for the opportunity to discuss FDA's regulation of foods derived from GE sources. I am happy to answer any questions you may have.

Daryl E. Thomas, Senior Vice President of Sales and Marketing

Herr Foods Inc.

U.S. Senate Committee on Agriculture, Nutrition and Forestry

"Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives"

328A Russell Senate Office Building

October 21, 2015

Introduction

First, I would like to thank the Senate Committee on Agriculture, Nutrition and Forestry, Chairman Roberts, and Ranking Member Stabenow for holding this hearing to talk about one of the most critical issues facing the food industry today. I greatly appreciate the opportunity to be here.

My name is Daryl Thomas. I am currently the Senior Vice President of Sales and Marketing for Herr Foods Inc. I have been in this position for 9 years. Herr's is a family owned snack food company that was started in 1946 by my father-in-law, James S. Herr.

Our corporate headquarters are located in Nottingham, Pennsylvania. We have two manufacturing facilities – one in Nottingham and one in Chillicothe, Ohio. We also operate 22 company warehouses located throughout the Northeast. Our products are distributed via 500 company-owned routes, 380 independent operator routes, and a network of brokers, wholesalers and distributors located throughout the 48 contiguous states. We also ship product directly to some retailers through their distribution systems. At any given time, Herr's product may be found in any of the United States.

GMO Labeling Debate

Over the last several years there have been a number of state ballot initiatives calling for mandatory GMO labeling. While voters have rejected ballot initiatives calling for mandatory GMO labels in four states (California, Washington, Colorado and Oregon), the Vermont state legislature approved the nation's first mandatory GMO labeling law, Act 120, in April 2014. The law is set to go into effect on July 1, 2016. This looming deadline makes it imperative that Congress work quickly to pass a voluntary GMO labeling bill that will pre-empt such state laws. Mandatory GMO labeling at the state level would create a patchwork of state regulations that would be virtually impossible for companies – particularly mid-sized, family-owned companies such as ours – to navigate.

Absent immediate action by Congress to create a federal GMO solution, manufacturers will have essentially three options in order to comply with a state labeling law such as Vermont's Act 120: 1) order new packaging for products going to each individual state with a labeling law, 2) reformulate products so that no labeling is required, or 3) halt sales to those states with

mandatory labeling laws. Each option is difficult, costly, time-intensive, and could eliminate jobs and consumer choice in the marketplace.

At Herr's it will be difficult for us to continue sales to the state of Vermont, although no final company decision has been made. If other states were to implement their own mandatory labeling laws, we would have to evaluate each state separately. These types of decisions are not easy for a mid-sized company such as ours to make. We are looking for ways to grow our business, not eliminate markets, but the cost and liability associated with the Vermont law are significant.

Our decision will be impacted by a letter we recently received from one of our customers and the largest grocery wholesaler in the United States. The letter informed manufacturers that the company "will not take additional steps to segregate or otherwise specifically direct the shipment of Vermont only products into Vermont." Essentially, this wholesaler will not stock specific SKUs (stock keeping units) in consideration of the new law.

Production Processes

One of the biggest barriers to comply with the Vermont mandatory GMO labeling law, let alone a patchwork of state labeling laws, is the manufacturing process itself.

First, it would require separate storage for GMO and non-GMO products throughout the entire supply chain, beginning on the farm. Farmers will need to separate their crops during planting and when transporting to grain elevators or manufacturers. Once a grain elevator or manufacturer receives the raw materials from farmers they too will need to store and produce GMO and non-GMO materials separately. Aside from new administrative and recordkeeping burdens, manufacturers such as Herr's will need to add separate storage areas to their facilities in order to segregate these products. For example, with our line of tortilla chips, the segregation process will begin in the field. There are two ways to begin the manufacturing process: one, by cooking the corn into a mash and the other by purchasing corn masa (flour), adding water to it, and then sheeting it for cutting into the appropriate shape. At Herr's we currently cook whole corn but will be moving to a masa flower process in 2016. A mandatory labeling scheme would require two different silos to hold GMO and non-GMO bulk corn and masa.

Given the expense of manufacturing machinery and the space required to house extra equipment, we would have to use the same equipment for both GMO and non-GMO lines. A thorough cleaning of the sheeting, baking, frying and seasoning lines between runs would have to occur to ensure no contamination happens. Such a process could take nearly eight hours and would lead to a loss in valuable production time.

Some advocates of mandatory GMO labels assume that companies will simply remove GMO ingredients from their products in a response to labeling requirements. However, this is an unrealistic expectation. At Herr's we have come to realize that the availability of non-GMO crops and ingredients is often very limited. We derive the vast majority of our ingredients from corn, cotton and soybeans, and more than 80 percent of these crops grown in the United States

are genetically modified.[1] At Herr's we use cottonseed and soybean oils in our potato chips and, of course, source corn for our tortilla chips.

Another complicating factor is the need for duplicative labeling film for the same SKU assigned to each product line. In order to comply with a patchwork of mandatory state labeling laws, our company would need to change film in mid-production and then keep multiple inventories of the same finished product: one for each state with a mandatory labeling law.

Significant lead times and costs also go into a bag design change. At Herr's we have approximately 411 SKUs, and we estimate that a bag design change for each SKU is approximately $5,500. This extra cost includes plate charges, new film and administrative oversight. To keep a different label for an individual state for all of our SKUs would cost millions of dollars per state. Additionally, the actual process of designing, compliance review, plate making, and lead-time for film would be 20-26 weeks each time a new label was required.

After production, our products are distributed through almost 900 routes and a network of brokers, wholesalers and distributors throughout the 48 contiguous states. Tracking individual state's SKUs for each step along this distribution channel will increase costs as well as heighten opportunity for mistakes, thereby leaving the company open to litigation.

To be clear, smaller, family-owned companies such as ours likely will be harder hit by this regulation than large multinational firms. A handful of multi-category, multi-national players may be better positioned to take on the added cost of a segregated system, while such a system could force consolidation among smaller players. In either case, the changes necessary to maintain individual state mandates will ultimately lead to higher costs on grocery shelves for consumers. While some consumers may be willing and able to pay these additional costs, other consumers simply might not be in a financial position to painlessly absorb increased prices on grocery store shelves.

Impact on Consumers and the Economy

Ultimately a patchwork of state mandatory GMO labeling laws will hit consumers the hardest, resulting in increased costs at the grocery store and/or less availability of products on store shelves. As I mentioned, Herr's has not made a final decision about whether or not to continue sales in Vermont. Ceasing distribution to a state is not simple, and it is not a decision we take lightly. We would have to notify our retailers of our decision to stop sales in Vermont, and we would be assuming some risk that retailers will not comply. If a retailer accidentally stocks our product without the appropriate label, we at Herr's are actually liable for that error.

With fewer players in the grocery aisle, there could be less incentive to keep quality high and prices low as competition decreases. If companies choose to eliminate sales in Vermont it could

[1] United States Department of Agriculture Economic Research Service. "Recent Trends in GE Adoption". July 14, 2014. Retrieved from: http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx

mean fewer route sales people, warehouse personnel, account executives and field managers. Fewer jobs could lead to a decrease in tax revenue in a given state.

A decrease in competition could also lead to an increase in costs to consumers of products on grocery shelves. While there has been great debate over how much of an increase in costs consumers could actually face, non-GMO or organic products are typically more expensive than their counterparts on store shelves. For some households a moderate increase in cost might be easily absorbed, but for others who already face food insecurity the impact could be devastating and wholly unnecessary.

GMO-Free Options Already Exist

First, we would like to note that Herr's has a strong commitment to safe products and we firmly believe the GMO ingredients we use are safe. We also support consumers having options in the marketplace. In fact, we have recently introduced a Non-GMO Project verified popcorn to our product lineup. The introduction of this product was supported by demand in the marketplace. Ultimately consumers vote with their dollars, and we at Herr's believe there is sufficient consumer demand at the right price point to support our non-GMO popcorn product. For other products in our portfolio, it is unclear if the market demand is there to justify a non-GMO product line, so we have made the business decision not to undergo a similar process for other products at this time. That said, other companies with different business models do provide non-GMO alternatives for potato chips, tortilla chips, pretzels and even cheese curls. Consumers who wish to purchase non-GMO snacks have that choice.

It is worth noting that from our experience, verification through the Non-GMO Project took approximately 6 months to complete. To go through this process for each of our 441 SKUs would be virtually impossible, and it is unclear whether third party verification systems could even handle this type of demand from a multitude of food manufacturers. Litigation is a very real threat, and in this environment Herr's would prefer to pursue third party verification for products labeled as non-GMO.

Herr's, along with many other food manufacturers, have already made the significant investment required to gain these voluntary certifications that give our customers the freedom to choose between products that are produced, distributed and marketed as organic and non-GMO. Forcing companies such as ours to re-label 99 percent of our product line does nothing but add cost, confusion and ultimately, may limit - instead of increase - choice for consumers.

The Politics of Labeling

Generally speaking, mandatory labels on food products are reserved for nutrition information and food safety information. As we heard from the previous panel of witnesses, the debate over the safety of GMOs is settled – the products on the market are safe, and they go through a rigorous approval process at multiple government agencies before they are deemed safe. Most GMOs don't alter the nutrition profile of food products. In fact, the Food and Drug

Administration has noted that genetic modification alone does not make a food product or ingredient materially different than a non-genetically modified product or ingredient.

Michael Landa, Director of the Center for Food Safety and Applied Nutrition at the Food and Drug Administration, aptly noted in his testimony in December 2014 before the House Committee on Energy and Commerce that "Federal courts have held that, absent a material fact or difference in a food derived from a GE source, section 403(a)(1) and 201(n) of the [Federal Food, Drug and Cosmetic Act] do not require labeling indicating that the food has been developed through genetic engineering. Further, courts have held that consumer desire to know such information is not, by itself, sufficient to require such labeling."

While there is not a food safety or statutory reason to require the labeling of GMO products in the marketplace today, we often hear from activists that food companies should label anyway because "consumers have a right to know." Some groups that make this claim only use their websites and marketing materials to demonize genetically modified crops. However, options for consumers who do not want to purchase foods with GMO ingredients already exist through certified non-GMO products or organic products.

It is also unclear what information exactly, a state GMO label would provide to consumers given that the proposed definitions of foods to be labeled as GMO vary from state to state. We support giving consumers transparency but transparency shouldn't be defined differently be every state. Vermont's law is confusing enough, but if 2, 3, or 10 more states are allowed to define what is GMO, set labeling protocol, and legislate fines for noncompliance, the U.S. food distribution system could be crippled.

Conclusion

Herr's is extremely concerned about proposals that would require the labeling of products containing GMOs. To be clear, I am not here to testify about the safety of GMO products as that has already been confirmed by the FDA. I'm here to advocate for a federal solution to a critical issue that could force hundreds of family owned companies like ours to make distribution decisions that would negatively impact sales, jobs, and food prices.

We urge the Senate to pass a national, voluntary standard before the law in Vermont can take effect and begin to disrupt markets. If a patchwork of state labeling laws are adopted, it will most certainly disrupt interstate commerce, as just a single state law in Vermont is already forcing companies to make difficult decisions about distribution in that state. However, even a federal mandatory standard would be harmful and counter-productive. Such mandates will only increase costs to food manufacturers and increase food prices for consumers.

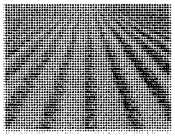
Again, thank you for your time and consideration of our views. I look forward to answering your questions.

DOCUMENTS SUBMITTED FOR THE RECORD

OCTOBER 21, 2015

The Register's Editorial: It's time for Congress to require GMO labeling

The Register's Editorial *3:28 p.m. CDT July 25, 2014*



(Photo: The Register)

A fight is brewing between America's consumers and the giant businesses that grow and manufacture our nation's foods. At issue is the use of so called GMOs, or genetically modified organisms, in those foods.

The fight over genetic engineering boils down to this underlying disagreement:

Consumers want to know what is in the foods they are eating. They want government — either their state or, better yet, the federal government — to require growers and processors to label their products to disclose the presence of GMOs so shoppers know what is in the foods they are buying at the supermarket.

Those growers, manufacturers and processors don't want to be forced to go to the expense of labeling their many products. And they especially don't want the government telling them what they must do. Besides, these companies say, research has shown that GMOs are not harmful to people's health.

The fight ratcheted up several notches this spring when Vermont became the first state to require labeling of foods made with GMOs when they are sold in that state. One giant trade organization, the Grocery Manufacturers Association, has sued in an attempt to block the Vermont law.

The debate really hasn't occurred in Iowa in a prominent way, in part because of the prevalence of GMOs in Iowa agriculture and because of the clout that such agribusinesses as DuPont Pioneer and Monsanto wield in this state. But that doesn't mean there aren't strong feelings in Iowa on both sides of the GMO labeling debate.

Even though Congress has done its best to ignore the labeling issue, agriculture and business interests are kidding themselves if they think the push for GMO disclosure is going to blow over anytime soon.

Scott Faber, vice president of government affairs for the Environmental Working Group, told Gannett's Christopher Doering last week, "We're in the midst of an area of food democracy the likes of which we've never seen. People want to know everything about their food, what's in it, who made it, where it's from, how it's made. The politicians who are trying to deny people the right to know about their food are running headlong into this sort of brick wall of opposition."

Doering reported last week that food and agribusiness companies, including Monsanto and DuPont, are supporting a bill by Rep. Mike Pompeo, R-Kan., that would ban mandatory GMO food labeling by the states and let food companies decide if they want to disclose the presence of GMOs on their package labels.

That's not going to be sufficient for the people who are buying these companies' products. Consumers want transparency. More than 60 other nations already give their shoppers that information so they can decide whether it's an issue for them if foods they buy contain genetically engineered ingredients.

Corporate America is fighting a losing battle over the GMO issue. Consumers wanted to know — and now product labels tell them — how much sugar is in their foods. Consumers have been pressuring restaurant chains to post the calorie counts for their various products, and those chains are coming around to understand the consumers' wishes.

It's the same with the use of GMOs. Congress should set a nationwide standard of disclosure and then let the individual consumers decide whether the presence of GMOs in a product is something that concerns them.

But keeping consumers in the dark is never the right thing to do.

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QUESTIONS AND ANSWERS

OCTOBER 21, 2015

Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Mr. Michael Gregoire

Chairman Pat Roberts

1. During the hearing, I was pleased to hear APHIS, EPA, and FDA testify that the White House Office of Science and Technology Policy (OSTP) review of the Coordinated Framework for the Regulation of Biotechnology will inform their consideration of how to best improve the regulation of plant biotechnology for the future. I understand that each agency's plan will allow the White House review, including public meetings and opportunities for public comments, to inform regulatory considerations. I understand that this theme was also expressed by thirteen farmer, scientific, and seed industry organizations in a letter calling for the White House to carefully consider regulatory policy that will continue to protect health and the environment while not stigmatizing new technologies or unnecessarily impeding innovation. What role will OSTP play in ensuring new regulations that impact the commercialization of new plant varieties are not introduced until the White House review has concluded? What assurances can you offer that the OSTP review process will inform the regulatory agencies' considerations for plant biotechnology?

Response:
The update of the Coordinated Framework and the development of a long-term strategy to ensure that the Federal regulatory system is well-equipped to assess efficiently the risks, if any, associated with future products of biotechnology is being undertaken by an interagency Biotechnology Working Group under the Emerging Technologies Interagency Policy Coordination Committee (ETIPC) with representatives from the Executive Office of the President, as well as the Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and United States Department of Agriculture (USDA). APHIS is an active participant in this interagency working group. As such, APHIS will be able to ensure that our efforts to update our biotechnology regulations under the Plant Protection Act are fully complementary with the activities of the working group. While the Coordinated Framework update and the long-term strategy are being developed, APHIS will concurrently consider options for revising APHIS regulations for the products of biotechnology. As part of the Executive Order 12866 review, agencies, such as OSTP, will have an opportunity to review the APHIS regulatory changes. Our process to revise the regulations will be a multi-year effort providing ample opportunity to take advantage of outcomes of the Biotechnology Working Group's efforts. We also want to better align our Agency's regulations with existing statutory authority. We also seek to better align

our regulatory oversight with risks to plant health, ensure that our regulatory program is more consistent with the current status of the science of biotechnology, and better prepare our regulatory framework for future products. Our work in these areas will complement and support the interagency efforts to update the Coordinated Framework, and develop modern tools to present the agencies' authorities, practices, and bases for decision making, while increasing transparency.

Senator Debbie Stabenow

1. During the Agricultural Biotechnology hearing, you stated, in response to a question, that USDA-APHIS has the authority to regulate new breeding technologies as it relates to plant and animal health. Can you describe what factors, or criteria, APHIS uses when considering whether a specific breeding technique is determined to be genetic engineering, and whether it poses a threat to plant or animal health?

Response: As envisioned by the Coordinated Framework and under the authority of the Plant Protection Act, APHIS regulates risks to plant health, rather than the specific process by which plants are transformed. APHIS regulates any organism which has been altered or produced through genetic engineering, if the donor organism, recipient organism, or vector or vector agent is a plant pest as defined in our regulations; or if it is or contains an unclassified organism, as well as any other organism or product altered or produced through genetic engineering which we determine is a plant pest or have reason to believe is a plant pest. We define a plant pest in our regulations as "any living stage (including active and dormant forms) of insects, mites, nematodes, slugs, snails, protozoa, or other invertebrate animals, bacteria, fungi, other parasitic plants or reproductive parts thereof; viruses; or any organisms similar to or allied with any of the foregoing; or any infectious agents or substances, which can directly or indirectly injure or cause disease or damage in or to any plants or parts thereof, or any processed, manufactured, or other products of plants." The principle aim of these regulations is to determine whether or not the GE product has the potential to result in the introduction or spread of plant pests, such as pathogens or insects that may cause harm to crops or other plants.

2. If Congress were to direct USDA to design a mandatory genetic engineering disclosure for food products, how would the Department implement this requirement so that the disclosure would be value-neutral about biotechnology and not misleading to consumers about the food safety of the product?

Response: If the Department were directed to design a mandatory disclosure program for GE food products, we would work within the provisions of the law to achieve any direction provided by Congress.

Senator Joni Ernst

1. Is your agency successfully ensuring food derived from biotech crops is safe for humans and animals to consume?

Response: Ensuring the safety of biotech crops for human food and animal feed is under the jurisdiction of the Food and Drug Administration, while APHIS examines these crops for their potential plant pest risk. I have great confidence in the overall safety of GE crops reviewed under the current U.S. regulatory system.

2. Would you agree that available studies suggest that biotech crops that have successfully completed the U.S. regulatory process have, in fact, had some very positive effects on the environment, including reduced chemical inputs and improved water quality?

Response: The Federal government has a coordinated, risk-based system to ensure that new biotechnology products are safe for the environment and human and animal health that is known as the Coordinated Framework for Regulation of Biotechnology. Within this framework, the U.S. Government agency with primary responsibility for this type of evaluation is the Environmental Protection Agency (EPA). As such, APHIS is not best suited to answer this question and we defer to our colleagues at EPA for this question.

Senator Patrick Leahy

1. Today, Brazil is the second largest producer of GE soy. The country has had a national requirement since 2004 that requires foods comprised of 1% or more GE components, must present on the product label a triangle on a yellow background with the letter "T" in the center and the expression "contains (name(s)) ingredient(s)) GM(s)." This is a mandatory, national label that simply, in a few words, conveys to consumers that the food contains GE products, but does so without any stigma about GE products. Since that Brazilian legislation was approved, to your knowledge, has there been a reduction in the consumption of GE foods in Brazil or an increase in their consumption?

Response: GE food safety and food labeling is overseen by the Food and Drug Administration, which we understand will be responding to this same question.

Senator David Perdue

1. The Safe and Accurate Food Labeling Act, passed by the house, outlines a voluntary certification program to label both GE and non-GE foods. Should this bill become law, how would the USDA need to restructure to comply, and what would be the cost?

Response:
Under the Safe and Accurate Food Labeling Act, USDA's Agricultural Marketing Service (AMS) would carry out the standards development and accreditation process utilizing an existing Agency structure with staff with expertise in the area of genetic engineering. The standards development process would require appropriations to cover the costs of hiring new staff needed to establish the criteria for products that would be eligible to bear a "Non-GE" or a "GE" claim. Depending on the length of time needed to develop the standard the cost could vary, but it is estimated that the cost to cover this standards development process is between $2 to $3 million per year and then $1 to $2 million per year to continue to employ the staff required to maintain and update the standard over time. The appropriations for the standards development costs up front would be used to cover added startup costs associated with public meetings, rulemaking, and outreach. However, the Agency envisions the ongoing costs associated with a voluntary labeling program would be covered by the user-fee authority in the Safe and Accurate Food Labeling Act.

The Safe and Accurate Food Labeling Act would also amend the Plant Protection Act—through which APHIS regulates some GE organisms— to require USDA to ensure that foods derived from GE plants available for sale have completed both USDA's regulatory process and the Food and Drug Administration's (FDA) voluntary consultation process. Under the Safe and Accurate Food Labeling Act, APHIS would need to establish a website and provide additional staffing resources to monitor and track APHIS' and FDA's processes associated with GE plants subject to these provisions of the Safe and Accurate Food Labeling Act. APHIS estimates the costs for the first year would be approximately $200,000 (establishing the website and allocating staffing resources) and $100,000 for the subsequent years. Additionally, if foods derived from a GE plant subject to these provisions were to enter the marketplace prior to FDA completing their voluntary consultation process, then APHIS would need to provide resources to respond and enforce compliance with the Act. Costs associated with a hypothetical compliance response are difficult to determine as they depend on a variety of factors such as the specific GE plant and the extent to which foods derived from the GE plant is presented into the marketplace. APHIS has worked very hard over the last several years to improve the biotechnology review process and decrease the amount of time it takes to make a final decision on new GE crops, without sacrificing any rigor in the Agency's scientific assessments. We hope these efforts provide developers and industry greater certainty about the review process. We do not want to see anything happen that will impede the progress APHIS has made and cause uncertainty and

unnecessary delay to the review process. USDA would be happy to provide technical assistance to the Committee on this issue if requested.

Senator John Thune

1. Agricultural biotechnology has been tremendously successful in creating new tools that enable farmers to grow crops with increasing productivity using sustainable agriculture practices. This has benefited the rural and American economy, and consumers, and improved our agricultural trade balance. I recently co-led a bipartisan letter with Senator Stabenow signed by 43 Senators to President Obama. We asked the president to seek a commitment from Chinese President Xi to move forward with approving the queue of U.S. biotechnology products, including those awaiting final import approvals.
   If mandatory labeling standards would be enacted in the United States, wouldn't this undercut our efforts to obtain approval for these products?

   Response: President Obama and Secretary Vilsack are committed to strengthening cooperation between our trading partners on the issue of biotechnology. In fact, at a recent bilateral between the U.S. and China, both sides committed to further improving the biotech approval process and reaffirmed the importance of timely, transparent, predictable, and science-based approvals for biotech products. USDA, through our Foreign Agricultural Service (FAS), has also been working with countries that are just now developing their biotechnology regulations to ensure that they are based on science and are transparent. APHIS will continue to support FAS in working with our trading partners on these issues.

2. On July 2 of this year the Executive Office of the President directed EPA, FDA and USDA to update the Coordinated Framework that guides the government in regulating the products of biotechnology. You provided in your testimony that APHIS is concurrently revising its regulations. I have a deep concern that the result of all of this regulatory revision will be even more burdensome regulations the ones we have now.
   Is this broad revision of current regulations necessary?

   Can you assure me that the final result will be a simpler, less complicated series of biotech regulations than those we have now?

   Because agriculture exports are so critical to many states, including my home state of South

Dakota which exports a third of the soybeans grown in the state, what message does this send to our overseas trading partners that need to approve our genetically modified crops for import?

Response: In any regulatory program that deals with complex scientific processes such as biotechnology, we always need to scan the horizon, look at what further advances may be made, and adjust our activities to meet the needs of the future. This is good business practice. This does not mean that our current regulations are insufficient; rather, it means that the United States is proactively addressing future needs, just as we and our trading partners and we would expect. Ultimately, we believe that we will better align our Agency's regulations with our statutory authority, better align our regulatory oversight with risks to plant health, and ensure that our regulatory program is more consistent with the current status of the science of biotechnology—all with the input of industry and our stakeholders. Consistent with the objectives laid out in the July 2, 2015 memo from the Executive Office of the President, *Modernizing the Regulatory System for Biotechnology* Products, APHIS will also work to prevent unnecessary barriers to future innovation and competitiveness by improving the transparency, coordination, predictability, and efficiency of our regulation of biotechnology products while continuing to protect health and the environment. We have already conducted a business process improvement for our current regulatory review process, and found ways of streamlining the process and adhering to set timelines. By doing so, we've provided more consistency and reliability for developers. We'll bring this experience and lessons learned to our work as we revise the regulations.

In addition, USDA will continue its outreach and capacity building with officials from foreign countries to inform them of the U.S. regulatory system and encourage them to adopt risk and science based regulatory systems like ours in order to facilitate trade in safe agricultural products. We believe these ongoing efforts will be instrumental in explaining APHIS' proposal to other countries, and ensuring that U.S. products that have completed the regulatory review process are ready for review and market access by key trading partners.

Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulations and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Mr. Gary Hirshberg

Senator Sherrod Brown

1. In your testimony, you called for a "value neutral disclosure," for genetically-engineered food. In light of the increased consumer awareness regarding their food and the strong growth in the organic sector, is it possible that many companies would adopt a voluntary label to maintain market share? Are there other forms of "value neutral disclosure" that would provide important information to consumers?

Companies have been able to make voluntary non-GMO disclosures since 2001 and consumers are more confused than ever. A voluntary labeling system would not provide consumers with basic, factual information about the presence of GMO ingredients. Research clearly shows that consumers, especially millennial consumers, want to know what is in their foods and how they are grown, so "absence" labeling will not satisfy this demand. As mentioned in my testimony, "presence" labeling of GMOs in most of the 64 nations who require labeling is value neutral – the labels simply state which genetically engineered ingredients are present. Fortunately, there are many examples of mandatory value-neutral disclosures, such as whether fish is "wild" or "farm-raised", orange juice is "from concentrate", food is irradiated, and more. Here are examples of other state-based value neutral labeling requirements:

- ***Forty-one states regulate the use of "sell by" and "use by" dates on food labels. For example, Massachusetts requires all products with a recommended shelf life of ninety days or less to bear a "sell-by" or "best-if-used-by" date on the package. Except for infant formula, FDA does not require that foods be labeled with "sell by" or "use by" dates. USDA also does not require such labeling, although the agency does regulate how the dates must be displayed if they are used.***
- ***Before Congress mandated our current federal Country of Origin Labeling (COOL) requirements (requiring that seafood labels bear information about country of origin, as well as whether the seafood was wild-caught or farm-raised), states such as Alabama, Mississippi, and Arkansas required labeling disclosing information about the source and production of catfish. Moreover, some states still restrict labeling of catfish to certain species. For example, Arkansas restricts the label "catfish" to only fish of the Family Ictaluridae, while***

in Tennessee, fish from the Family Ictaluridae and the Family Anarchichadidae may be labeled "catfish." Louisiana allows fish of the Families Ictaluridae, Ariidae, and Loricariidae to be termed "catfish" on labels.

- ***Many states regulate the labeling of "cottage foods," i.e. foods made in the home, which are often sold at places like farmers markets. For example, Michigan requires that cottage goods be labeled as "made in a home kitchen that has not been inspected by the Michigan Department of Agriculture & Rural Development." There does not appear to be any federal regulation specific to the labeling of cottage foods.***
- ***Many states were already regulating the labeling of bottled water before FDA set standard of identity requirements for bottled water products, and while the NLEA preempts state labeling requirements conflicting with the standard of identity requirements, other aspects of state regulation may still be enforced. For example, California requires that bottles of water bear "a clear and conspicuous statement that informs consumers how to access water quality information."***
- ***While USDA AMS issues voluntary grading standards for some agricultural products, many states regulate the grade labeling (e.g., "Grade A" or "Grade B") of products such as maple syrup, honey, and juice. For example, Vermont has established grade standards for maple syrup. Vermont recently updated its grading standards, and according to the Vermont Agency of Agriculture, "USDA, Agriculture Canada and other states are all in the process of changing their grading systems to mirror the ones adopted here." Florida regulates the grading of citrus products, and Wisconsin regulates the grading and labeling of cheese and butter.***
- ***In addition to grading restrictions, Wisconsin requires that cheese made in that state specify its type and age.***
- ***Maryland and Rhode Island require food labels to disclose when certain fresh foods have been previously frozen.***

Senator Heidi Heitkamp

1. When consumers think of GMOs, they often think of herbicides and pesticides. With the Organic label, they know they're getting non-GMO, non-pesticide food. However, non-GMO foods can be – and are – still grown with conventional methods and sprayed with pesticides. Whether we have a "contains GMO" or "non-GMO" label, either way consumers may think that if they buy the product without GMOs they're buying a

product grown without herbicides or pesticides – which is not true and misleading to the consumer. How would we address this, if the goal is to provide more information and not less to consumers?

Providing more factual information, not less, will lead consumers to learn more about their food and how it is grown. The adoption of a GMO disclosure is not by itself misleading; it is simply a factual disclosure about the food. But, the adoption of a GMO disclosure will also encourage consumers to investigate the benefits and costs of GMO crop production. Ultimately, a GMO disclosure trusts consumers to do their own homework and make their own judgments.

Senator Patrick Leahy

1. Today, 10 states – California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont – all have passed various "bottle bills" that mandate beverage container deposits ranging from 2.5¢ to 15¢ per container, the most common amount being 5¢ per container. While beer and soft drink containers are subject to deposits in all 10 states, only six states require mineral water containers, four states cover malt containers, and three states have wine coolers, liquor, and carbonated mineral water containers. Then there is some variety with other products: Michigan includes containers of canned cocktails, New York includes containers of soda water, Maine includes containers of juices and tea. In most states, the deposit requirements apply to the full range of container types, including glass, plastic, aluminum, and steel, but the State of Delaware, however, has exempted aluminum from its requirement. It seems that beverage companies in this country, from sodas, to beer, and beyond, have been able to follow this "patchwork" of bottle redemption laws. In your testimony, Mr. Thomas, you said that "smaller, family-owned companies such as ours likely will be harder hit by this regulation than large multinational firms." To your knowledge do any smaller, family-owned beverage companies find it cost prohibitive to include a "VT 5¢" on their bottles, as well as a "MI 10¢" on the bottles they sell throughout the 48 contiguous states with a network of brokers, wholesalers, and distributors?

Whether I buy a soda in Vermont or Kansas, it will have the label on it for these redemption laws. How have these beverage companies been able to do this but a label on a food package for one single state's GE labeling law is impossible?

To the best of my knowledge, no beverage companies have found it cost-prohibitive to include a "VT 5¢"as well as a "MI 10¢" on the bottles they sell throughout the 48 contiguous states. Furthermore, food companies often change their labels, and adding a value neutral disclosure to the package for some or all of their products would not be cost prohibitive.

2. I believe that both of your companies sell products that contain artificial flavors. For example Mr. Thomas, a number of products in Herr's line contain artificial flavors such as "Honey BBQ Flavored", "Cheddar & Sour Cream", "Baby Back Ribs", and "Sour Cream and Onion", just to name a few. Does the requirement that you include the phrase "artificially flavored" on your packaging have any costs associated the same way you say that a label for GE ingredients will? You are required to put that label on the front of your products, and these are all the ingredients that have been proven to be safe. How is the "artificially flavored" label any different from including a label that the food contains safe GE ingredients?

   The requirement to include the phrase "artificially flavored" on a package does not increase the cost of the product and isn't substantially different from labeling a food containing GE ingredients.

3. In the last five years, has Herr's or Stonyfield Yogurt experienced any shifts in the prices of your ingredients that have led your companies to make changes to your ingredients for a particular product? Was that change made to save your company money? What were the costs associated with updating the ingredient panel? Those packaging updates did not make changes cost prohibitive did they?

   Stonyfield Yogurt hasn't experienced any costs associated with updating the ingredient panel associated with any changes to the ingredients used, and packaging updates certainly did not make changes cost prohibitive.

Senator Joni Ernst

1. Mr. Hirshberg, you indicated that since farmers started using GMOs, they've sprayed increasing amounts of chemicals on their fields. I don't know about the farmers you're familiar with, but in Iowa, they are the first stewards of the land, and are focused on running sustainable businesses. In fact, but utilizing GMO technology, such as planting Bt corn, conventional farmers can actually utilize fewer pesticides than their organic counterparts.

   On the first panel, Mr. Jordan with the EPA spoke to the value of Plant Incorporated Protectants (PIPs) such as Bt, and testified that "experts have concluded that by planting PIPs, growers have reduced by more than a third – many millions of pounds – their reliance on broad spectrum, synthetic insecticides. The result is reduced exposure to such pesticides for workers and non-target wildlife, less ground and surface water contamination by such pesticides, and less residue of such pesticides on food."

   How would you respond to that statement from the EPA? Shouldn't we be more critical of the amount of pesticides being applied to non-GMO crops? In light of these statements from the EPA, are you willing to admit that GMO crop production has led to reduced pesticide use?

   USDA survey data clearly and indisputably shows that while it is true that the use of new genetically engineered corn and soy containing Bt insecticides has led to less insecticides being sprayed, the exact opposite phenomenon has occurred with the use of herbicides. The widespread adoption of herbicide-tolerant GMO corn and soybeans has been the main driver behind the 16-fold increase in the use of glyphosate on farmland between 1992 and 2012, which was recently deemed "probably carcinogenic" by the world's cancer experts at the International Agency for Research on Cancer (IARC). I have attached a Washington State University paper documenting the increase in the use of glyphosate between 1996 and 2011. The data, which have been peer-reviewed and published in one of the world's most prominent and credible environmental science journals, show that GMO crops led to a 527 million pound increase in herbicide use in the U.S. between 1996, the first year that genetically engineered herbicide-tolerant corn was planted, and 2011. Estimates from leading weed pest scientists indicate that farmers used over 300 million pounds of glyphosate in 2014. The significant increases in herbicide usage far exceed the reductions in insecticide usage so that the net effect is far more pesticides being used across Iowa and all other farm states as a result of GMO crop proliferation.

Benbrook *Environmental Sciences Europe* 2012, **24**:24
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Impacts of genetically engineered crops on pesticide use in the U.S. – the first sixteen years

Charles M Benbrook

Abstract

Background: Genetically engineered, herbicide-resistant and insect-resistant crops have been remarkable commercial successes in the United States. Few independent studies have calculated their impacts on pesticide use per hectare or overall pesticide use, or taken into account the impact of rapidly spreading glyphosate-resistant weeds. A model was developed to quantify by crop and year the impacts of six major transgenic pest-management traits on pesticide use in the U.S. over the 16-year period, 1996–2011: herbicide-resistant corn, soybeans, and cotton; *Bacillus thuringiensis (Bt)* corn targeting the European corn borer; *Bt* corn for corn rootworms; and *Bt* cotton for Lepidopteron insects.

Results: Herbicide-resistant crop technology has led to a 239 million kilogram (527 million pound) increase in herbicide use in the United States between 1996 and 2011, while *Bt* crops have reduced insecticide applications by 56 million kilograms (123 million pounds). Overall, pesticide use increased by an estimated 183 million kgs (404 million pounds), or about 7%.

Conclusions: Contrary to often-repeated claims that today's genetically-engineered crops have, and are reducing pesticide use, the spread of glyphosate-resistant weeds in herbicide-resistant weed management systems has brought about substantial increases in the number and volume of herbicides applied. If new genetically engineered forms of corn and soybeans tolerant of 2,4-D are approved, the volume of 2,4-D sprayed could drive herbicide usage upward by another approximate 50%. The magnitude of increases in herbicide use on herbicide-resistant hectares has dwarfed the reduction in insecticide use on *Bt* crops over the past 16 years, and will continue to do so for the foreseeable future.

Keywords: Herbicide-resistant crops, Herbicide-tolerant soybeans, Glyphosate, 2,4-D, *Bt* crops, Genetically engineered corn, Roundup Ready crops, Biotechnology and pesticide use, Glyphosate resistant weeds

Background

Public debate over genetically engineered (GE) crops is intensifying in the United States (U.S.), driven by new science on the possible adverse health impacts associated with herbicide-resistant (HR) crop pesticide use, and the rapid spread of glyphosate-resistant weeds. Still, many experts and organizations assert that GE crops have reduced, and continue to reduce herbicide, insecticide, and overall pesticide use. Fortunately, high quality and publically accessible U.S. Department of Agriculture (USDA) pesticide use data are available and can be used to track changes in pesticide use on crops containing GE traits. Moreover, the impacts of these traits on U.S. pesticide use trends are substantial and obvious, especially in recent years as a result of the growing number and geographical spread of glyphosate-resistant (GR) weeds.

Stable reductions in insecticide use in *Bt*-transgenic corn are also now in jeopardy as a result of the emergence of corn rootworm (CRW) populations resistant to the Cry 3Bb1 toxins expressed in several corn hybrids [1,2]. To combat this ominous development, some seed and pesticide companies are recommending a return to use of corn soil insecticides as a resistance management tool. There is a degree of irony in such recommendations, given that the purpose of Cry 3Bb1 corn was to eliminate the need for corn soil insecticides.

The emergence of herbicide-resistant genetically engineered crops in 1996 made it possible for farmers to use a broad-spectrum herbicide, glyphosate, in ways that were

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Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

previously impossible. From 1996 through 2011, 0.55 billion hectares of HR corn (*Zea mays*), soybeans (*Glycine max*), and cotton (*Gossypium hirsutum*) were grown in the U.S. [Additional file 1: Table S7]. In 2011, an estimated 94% of the soybean area planted, 72% of corn, and 96% of cotton were planted to HR varieties, respectively, while about 65% of corn and 75% of cotton hectares in the U.S. were planted to *Bt* varieties [Additional file 1: Table S6].

Glyphosate-resistant, Roundup Ready (RR) crops now comprise the overwhelming majority of HR crops. RR crops were rapidly adopted because they provided farmers a simple, flexible, and forgiving weed management system, especially compared to systems reliant on the low-dose, persistent herbicide chemistries on the market in the late 1990s, such as imazethapyr (43% soybean hectares treated in 1996) and chlorimuron-ethyl (14% treated). From 1996 through 2008, HR crops resistant to herbicides other than glyphosate either disappeared from the market (e.g. bromoxynil HR cotton), or have been planted on relatively few hectares (e.g. glufosinate HR, LibertyLink cotton and corn).

Net reductions in pesticide use, encompassing changes in both herbicide and insecticide kilograms/pounds applied, are among the purported claims of GE crops [3-5]. Analysts assessing the impacts of *Bt* crops on insecticide use report reductions, or displacement, in the range of 25% to 50% per hectare [6]. A more recent study reports a 24% reduction [5]. On GE and non-GE corn since 1996, the volume of insecticides applied has declined, because of the pesticide industry-wide trend toward more biologically active insecticides applied at incrementally lower application rates.

The corn rootworm (CRW) has been the target of the majority of corn insecticide applications the last several decades. The average corn insecticide application rate in 1996 was about 0.76 kilograms of active ingredient per hectare (kgs/ha) (0.7 pounds/acre) and is less than 0.2 kgs/ha today (0.18 pounds a.i./acre) [Additional file 1: Table S12]. The two contemporary corn soil insecticide market leaders – tebupirimiphos and tefluthrin – are applied at average rates around 0.13 kgs/ha (0.12 pounds/acre). In 1996, the market leaders were chlorpyrifos and terbufos, insecticides applied at rates above 1.12 kgs/ha (1.0 pounds/acre) [Additional file 1: Table S12]. Obviously, planting *Bt* corn in 2011 reduced insecticide use less significantly compared to land planted to *Bt* corn in the late 1990s.

Few comprehensive estimates have been made of the impacts of HR crops on herbicide use. The USDA has not issued a new estimate in well over a decade; the USDA's Economic Research Service (ERS) reported an 3.7 million kg (8.2 million pound) decrease in pesticide use in 1998 as a result of GE corn, soybeans, and cotton [7], an estimate that is comparable to the present study's estimate of a 4.4 million kg (9.6 million pound) reduction [Additional file 1: Table S15]. A series of unpublished simulation studies have been carried out by the National Center for Food and Agriculture Policy (NCFAP). In a report covering crop year 2005, NCFAP projected that HR corn, soybean, and cotton reduced total herbicide use by 25.6 million kgs, compared to hectares planted to non-HR varieties [6]. Sankula's herbicide use estimates are based on observations of mostly university experts regarding "typical" herbicide use rates on farms planting HR versus non-HR varieties. The rates incorporated in Sankula's estimates often differ from those published for the same year by USDA's National Agricultural Statistics Service (NASS) [8]. NASS reported that an average 1.5 applications of glyphosate were made on HR soybeans in 2005, while Sankula assumes only 1.18 applications. Sankula's estimate of total herbicide use on RR soybeans in 2005, 1.15 kgs/ha (1.03 pounds/acre), is less than the NASS figure for glyphosate alone, 1.23 kgs/ha (1.1 pounds/acre). If true, Sankula's data suggests that essentially no other herbicides were applied to RR soybeans in 2005, when in fact the average soybean hectare in 2002 was treated with 1.66 herbicides according to NASS data.

This paper quantifies the impacts of GE crops on the kilograms of pesticides applied per hectare and across all GE hectares, drawing upon publicly accessible USDA data. The pesticide use impacts of the six major, commercial GE pest-management traits are modeled and then aggregated over the 16 years since commercial introduction. While most of the pesticide use data incorporated in the model were originally reported by U.S. government agencies in pounds of active ingredient, and/or pounds of a.i./acre, results are reported herein in SI units (kilograms of active ingredient and kg/ha). Some key results are also reported in pounds/acre. Convert kilograms to pounds by multiplying by 2.205, and pounds to kgs by multiplying by 0.454. To convert from kg/ha to pounds/acre, multiply by 0.893; to convert from pounds/acre to kg/ha, multiply by 1.12.

Results and discussion

Farmers planted 0.55 billion hectares (1.37 billion acres) of HR corn, soybeans, and cotton from 1996 through 2011, with HR soybeans accounting for 60% of these hectares [Additional file 1: Table S7]. In terms of overall herbicide use per hectare based on NASS data, substantial increases have occurred from 1996 through 2011. In soybeans, USDA reported herbicide applications totaling 1.3 kgs/ha (1.17 pounds/acre) in 1996, and 1.6 kgs/ha (1.42 pounds/acre) in 2006, the last year soybeans were surveyed by USDA. In cotton, herbicide use has risen from 2.1 kgs/ha (1.88 pounds/acre) in 1996 to 3.0 kgs/ha (2.69 pounds/acre) in 2010, the year of the most recent USDA survey. In the case of corn, herbicide use has fallen marginally from 3.0 kgs/ha (2.66 pounds/acre) in 1996 to 2.5 kgs/ha

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

(2.26 pounds/acre) in 2010, largely as a result of lessened reliance on older, high-rate herbicides.

Compared to herbicide use rates per hectare on non-HR hectares, HR crops increased herbicide use in the U.S. by an estimated 239 million kgs (527 million pounds) in the 1996–2011 period, with HR soybeans accounting for 70% of the total increase across the three HR crops. Rising reliance on glyphosate accounted for most of this increase.

In light of its generally favorable environmental and toxicological properties, especially compared to some of the herbicides displaced by glyphosate, the dramatic increase in glyphosate use has likely not markedly increased human health risks. Because glyphosate cannot be sprayed on most actively growing, non-GE plants, residues of glyphosate in food have been rare, at least until the expansion ~ 2006 in the number of late-season glyphosate applications on wheat and barley as a harvest aid and/or to control escaped weeds. Presumably as a result of such uses, 5.6% of 107 bread samples tested in 2010 by the U.K. Food Standards Agency contained glyphosate residues [9]. Three samples had 0.5 parts per million of glyphosate [9], a relatively high level compared to the other pesticides found in these bread samples.

Budget pressures have forced the U.S. Department of Agriculture to reduce the number of crops included in its annual NASS pesticide use survey. Soybean pesticide use has not been surveyed since 2006, about when the spread of glyphosate-resistant weeds began to significantly increase herbicide use in selected areas. Herein, total herbicide use on HR hectares is projected to rise 13.5% from 2006–2011 (about 2.7% annually), compared to a 6.6% (1.3% annually) increase on conventional soybean hectares. By way of contrast, the NASS-reported glyphosate rate of application per crop year on the average hectare of soybeans increased 8.9% per annum from 2000–2006 (see Table 1). So, despite the significant and widespread challenges inherent in managing glyphosate-resistant weeds in the 2006–2011 period, a substantial decrease is projected in the rate of increase in glyphosate applications per hectare of HR soybeans. The justification for this projected fall in the rate of increase is recognition by farmers that further increases in glyphosate use will likely not prove cost-effective, coupled with positive responses by farmers to the near-universal recommendation that corn-soybean farmers incorporate into their spray programs herbicides that work through modes of action other than glyphosate's [10-15].

Since 1996, about 317 million trait hectares (782 million trait acres) have been planted to the three major *Bt* traits – *Bt* corn for European corn borer (ECB) and CRW, and *Bt* cotton. *Bt* corn and cotton have delivered consistent reductions in insecticide applications totaling 56 million kgs (123 million pounds) over 16 years of commercial use. *Bt* corn reduced insecticide use by 41 million kgs (90 million pounds), while *Bt* cotton displaced 15 million kgs (34 million pounds) of insecticide use.

Table 1 Projected rates of change in herbicide use since the most recent USDA survey, relative to recent annual percent changes in rates

	2010-2011	2005-2010	Per Year 2005-2010
Corn			
Total Herbicides	2%	10.2%	2.0%
Glyphosate	2.5%	12.9%	2.6%
Soybeans	**2007-2011**	**2000-2006**	**Per Year 2000-2006**
Total Herbicides	3.2%	35.2%	5.9%
Glyphosate	3.3%	53.4%	8.9%
Cotton	**2010-2011**	**2007-2010**	**Per Year 2007-2010**
Total Herbicides	2.2%	3.1%	1.0%
Glyphosate	-1%	-10.3%	-3.4%

Taking into account applications of all pesticides targeted by the traits embedded in the three major GE crops, pesticide use in the U.S. was reduced in each of the first six years of commercial use (1996–2001). But in 2002, herbicide use on HR soybeans increased 8.6 million kgs (19 million pounds), driven by a 0.2 kgs/ha (0.18 pounds/acre), increase in the glyphosate rate per crop year, a 21% increase. Overall in 2002, GE traits increased pesticide use by 6.9 million kgs (15.2 million pounds), or by about 5%. Incrementally greater annual increases in the kilograms/pounds of herbicides applied to HR hectares have continued nearly every year since, leading to progressively larger annual increases in overall pesticide use on GE hectares/acres compared to non-GE hectares/acres. The increase just in 2011 was 35.3 million kgs (77.9 million pounds), a quantity exceeding by a wide margin the cumulative, total 14 million kg (31 million pound) reduction from 1996 through 2002.

Total pesticide use has been driven upward by 183 million kgs (404 million pounds) in the U.S. since 1996 by GE crops, compared to what pesticide use would likely have been in the absence of HR and *Bt* cultivars. This increase represents, on average, an additional ~0.21 kgs/ha (~0.19 pounds/acre) of pesticide active ingredient for every GE-trait hectare planted. The estimated overall increase of 183 million kgs (404 million pounds) applied over the past 16 years represents about a 7% increase in total pesticide use.

There are two major factors driving the upward trend in herbicide use on HR hectares compared to hectares planted to non-HR crops: incremental reductions in the application rate of herbicides other than glyphosate applied on non-HR crop hectares, and second, the emergence and rapid spread of glyphosate-resistant weeds. The first factor is driven by progress made by the

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

pesticide industry in discovering more potent herbicidal active ingredients effective at progressively lower rates of application.

Twenty-seven percent of U.S. soybean hectares in 1996 were treated with pendimethalin at an average rate of 1.1 kgs/ha and another 22% were sprayed with trifluralin at a rate of 0.99 kgs/ha, while the market leader (imazethapyr) was applied to 43% of hectares planted at a rate of 0.07 kgs/ha [16]. By 2002 the combined percentage of soybean hectares treated with these two high-dose herbicides had dropped from 49% to 16% [17], and just 5% were treated in 2006 [18]. Between 1996 and 2006, the number of registered soybean herbicides applied at rates below 0.11 kgs/ha increased from nine to 17. As a result, the amount of herbicides applied to conventional crops has steadily fallen since 1996. In contrast, glyphosate is a relatively high-dose herbicide that is usually applied at a rate between 0.67 to 0.9 kgs per hectare.

Resistant weeds

The emergence and spread of glyphosate-resistant weeds is the second, and by far most important factor driving up herbicide use on land planted to herbicide-resistant varieties. Glyphosate resistant (GR) weeds were practically unknown before the introduction of RR crops in 1996. The first glyphosate-resistant weed (*Lolium rigidum*) emerged in Australia in 1996 from canola, cereal crop, and fence line applications [19]. In the mid-1990s, as the first glyphosate-resistant crops were moving toward commercialization and gaining market share, Monsanto scientists wrote or were co-authors on several papers arguing that the evolution of GR weeds was unlikely, citing the herbicide's long history of use (~20 years) and relative absence of resistant weeds [20,21].

Other scientists, however, challenged this assertion [22]. Dr. Ian Heap, long-time manager of the international database on resistant weeds, warned in a 1997 conference presentation that to limit glyphosate selection pressure in Roundup Ready cropping systems, the herbicide would need to be used in conjunction with proven resistance-management practices and with non-chemical weed control methods [23]. A 1996 report by Consumers Union stated that HR crops are "custom-made" for accelerating resistance and called for the Environmental Protection Agency (EPA) to revoke approval of HR crops when and where credible evidence of resistance emerges [24].

Today, the Weed Science Society of America (WSSA) website lists 22 GR weed species in the U.S. [19]. Over two-thirds of the approximate 70 state-GR weed combinations listed by WSSA have been documented since 2005, reflecting the rapidly spreading nature of the GR-weed problem. According to the WSSA, over 5.7 million hectares (14 million acres) are now infested by GR weeds, an estimate that substantially underestimates the actual spread of resistant weeds [16,22], [and personal communication, Dr. Ian Heap]. Dow AgroSciences carried out a recent survey on the percent of crop acres/hectares in the U.S. impacted by glyphosate-resistant weeds [25]. Findings from the survey were provided to USDA in support of Dow AgroSciences's petition for deregulation of 2,4-D herbicide-resistant corn, and suggest that around 40 million hectares (100 million acres) are already impacted by glyphosate-resistant weeds, an estimate that Heap considers inflated [personal communication]. The true extent of spread in the U.S. likely lies around the midpoint between the WSSA and Dow AgroSciences estimates (i.e., 20–25 million hectares), and by all accounts, will continue to rise rapidly for several years.

Why have GR weeds become such a serious problem? Heavy reliance on a single herbicide – glyphosate (Roundup) – has placed weed populations under progressively intense, and indeed unprecedented, selection pressure [10]. HR crops make it possible to extend the glyphosate application window to most of the growing season, instead of just the pre-plant and post-harvest periods. HR technology allows multiple applications of glyphosate in the same crop year. The common Midwestern rotation of HR corn-HR soybeans, or HR soybeans-HR cotton in the South, exposes weed populations to annual and repetitive glyphosate-selection pressure.

These factors trigger a perfect storm for the emergence of GR weeds. Research has traced the resistance mechanism in Palmer amaranth (*Amaranthus palmeri*) to 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) gene amplification. Resistant weed populations from Georgia contained 5-fold to 160-fold more copies of the EPSPS gene, compared to susceptible plants [26]. Moreover, EPSPS gene amplification is heritable, leading Gaines et al. to warn that the emergence of GR weeds "endangers the continued success of transgenic glyphosate-resistant crops and the sustainability of glyphosate as the world's most important herbicide."

Resistant Palmer amaranth (*Amaranthus palmeri*) has spread dramatically across southern states since the first resistant populations were confirmed in 2005, and already poses a major economic threat to U.S. cotton production. Some infestations are so severe that cotton farmers have been forced to leave some crops unharvested.

Responding to resistance

GR weed phenotypes are forcing farmers to respond by increasing herbicide application rates, making multiple applications of herbicides, applying additional herbicide active ingredients, deep tillage to bury weed seeds, and manual weeding. In recent years the first three of the above responses have been the most common. Each response increases the kilograms of herbicides applied on HR crop hectares. All five interventions increase costs.

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

Moreover, if 2,4-D and dicamba herbicide-resistant corn and soybeans are fully deregulated by the U.S. government, there will be growing reliance on older, higher-risk herbicides for management of glyphosate-resistant weeds.

Based on an upward trajectory in the planting of 2,4-D HR corn reaching 55% of corn hectares planted by 2019, coupled with an average of 2.3 applications (the label allows three) and an average rate of 0.94 kgs/ha (0.84 pounds/acre) (the label allows 1.12 kgs/ha (1.0 pounds/acre)), 2,4-D use on corn in the U.S. would increase over 30-fold from 2010 levels [Additional file 1: Table S19]. Such a dramatic increase could pose heightened risk of birth defects [27,28] and other reproductive problems [29], more severe impacts on aquatic ecosystems [30], and more frequent instances of off-target movement and damage to nearby crops and plants. Moreover, the efficacy of 2,4-D corn may well prove short lived, since a population of 2,4-D resistant waterhemp (*Amaranthus tuberculatus*) has now been confirmed in Nebraska [31], and there are already at least eight other weeds resistant to 2,4-D [19].

GR weeds typically emerge first on a few isolated fields, but their pollen, genes, and seeds can travel widely and spread quickly, especially if glyphosate continues to be relied on heavily [11]. No substantial change in the intensity of glyphosate use in the U.S. is expected in the foreseeable future; nearly all corn, soybean, and cotton cultivars now carry a RR gene. The seed industry has no plans to grow and sell more non-HR seed, and indeed is moving in the opposite direction by developing more stacked, multiple HR varieties. The share of total national corn, soybean, and cotton hectares impacted by GR weed populations is likely to grow and will, as a result, increase both the number of different herbicides applied, as well as the total kgs of herbicides applied.

As argued by many weed scientists and extension specialists, integrated weed management systems, coupled with markedly lessened reliance on RR technology are now essential to extend the useful life of RR technology [10,12,14,32]. Without major change, a crisis in weed management systems is likely, triggering possibly ominous economic, public health, and environment consequences.

Higher costs triggered by resistont weeds and HR technology

Weed management costs per hectare increase by 50% to 100% or more in fields infested with glyphosate-resistant weeds, as evident in a series of case studies submitted to the USDA by Dow AgroSciences in support of its petition to the USDA seeking deregulation of 2,4-D herbicide-resistant corn [25]. In soybean production in Arkansas, for example, Dow AgroSciences compared the average cost/acre of the top-five, most popular herbicide programs in Roundup Ready soybeans in fields without resistant weeds, compared to the average of two recommended programs in fields infested with glyphosate-resistant Palmer amaranth. Herbicide costs rise 2.7-fold (from $16.29 to $44.34 per acre) [23], [Table thirty, page 93]. In Illinois soybean production, the increase in herbicide costs is estimated at 64% ($19.21 to $31.49 per acre) [23], [Table thirty-two, page 95], while in Iowa corn production, the increase is 67% ($19.23 to $32.10 per acre) [23], [Table thirty-six, page 99].

The markedly higher cost/hectare of herbicide-resistant seeds must be added to the higher herbicide costs noted above to more fully reflect the added costs associated with HR technology. The cost of a bushel of conventional, not-GE soybean seed increased during the GE-crop era from $14.80 in 1996 to $33.70 in 2010, while a bushel of GE soybean seed cost, on average, $49.60 in 2010 (all seed price data derived from USDA data) [33]. Accordingly, the cost of GE soybean seed in 2010 was 47% higher per bushel than non-GE seed. In the case of corn, conventional seed prices rose from $26.65 per acre planted in 1996 to $58.13 in 2010. The average cost of GE corn seed per acre in 2010 was $108.50, with some GE cultivars selling for over $120 per planted acre. Hence, GE corn seed costs per acre were about double the cost conventional seed.

Public health concerns

Heightened risk of public health impacts can be expected in the wake of more intensive herbicide use, especially applications later in the season on herbicide-resistant crop varieties. While current risk assessment science suggests that glyphosate is among the safer herbicides per hectare treated in terms of human health risks, both the frequency of human exposures and levels of exposure via food, drinking water, and the air have no doubt risen in the U.S. in recent years. Two-thirds to 100% of air and rainfall samples tested in Mississippi and Iowa in 2007–2008 contained glyphosate [34].

The likely approval and use of herbicide-resistant crops in the U.S. engineered to survive applications of multiple herbicides adds tricky new dimensions to herbicide-risk assessments. Applications later in the growing season will be more likely to lead to residues in silage or forage crops. As a result, herbicide residues in milk, meat, or other animal products might become more common. The jump in herbicide volumes applied during June and July will increase the risk of drift and herbicide movement via volatilization, possibly exposing people via the air, water, or crops grown in the proximity of treated fields. Risks from the drift and volatilization of 2,4-D and dicamba are of special concern, given that these two herbicides have triggered thousands of non-target crop damage episodes over the last 20 years in the U.S. Indeed, for several years,

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

2,4-D has been the leading cause of crop damage episodes investigated by State departments of agriculture [35].

Environmental impacts linked to HR technology

A long list of environmental effects can be triggered, or made worse, by the more intensive herbicide use required to keep pace with weeds in farming systems heavily reliant on herbicide-resistant crops. Glyphosate has been shown to impair soil microbial communities in ways that can increase plant vulnerability to pathogens [36-38], while also reducing availability of certain soil minerals and micronutrients [39]. Landscapes dominated by herbicide-resistant crops support fewer insect and bird species; e.g., a study in the American Midwest reported a 58% decline in milkweed and an 81% drop in monarch butterflies from 1999 to 2010 [40]. Heavy use of glyphosate can reduce earthworm viability [41] and water use efficiency [42]. Several studies have documented reductions in nitrogen fixation in herbicide-resistant soybean fields sprayed with glyphosate [43,44]. Transgene flow from herbicide-resistant crops can occur via multiple mechanisms and can persist in weedy relatives [45].

Individually, these environmental impacts appear, for the most part, of the same nature and in the same ballpark as the risks associated with other herbicide-based farming systems, but collectively they raise novel concerns over long-term, possibly serious impacts on biodiversity, soil and plant health, water quality, aquatic ecosystem integrity, and human and animal health.

Bt corn and cotton impacts and prospects

While *Bt*-transgenic corn and cotton have displaced an estimated 56 million kgs (123 million pounds) of insecticides since 1996, every plant in a *Bt* corn or cotton field is manufacturing within its cells one or more forms of the natural bioinsecticide *Bacillus thuringiensis*. The rate of synthesis of *Bt* Cry protein endotoxins is roughly proportional to the rate of plant growth. As plants mature and enter senescence, *Bt* endotoxin expression falls.

Few published estimates are available of *Bt* endotoxin expression levels in contemporary corn cultivars. Nguyen et al. projected that a hectare of *Bt*-corn for CRW control expressing the Cry3Bb1 gene in MON88017 corn produces 905 grams of Cry3Bb1 per hectare (0.8 pounds per acre) [46]. The amount of *Bt* Cry proteins produced by a hectare of *Bt* corn for ECB and CRW control are calculated in [Additional file 1: Tables S20–S22], with key results shown in Table 2 for specific corn events, traits, and endotoxins. [Additional file 1 Tables S23–25] cover *Bt* cotton events. Expression level data reported by companies in regulatory documents were used to calculate per hectare production of specific endotoxins. [Additional file 1: Tables S21 and Table S24 contain the expression level data for *Bt* corn and cotton events, and [Additional file 1: Table S22 and Table S25] report the volumes of *Bt* Cry proteins produced per hectare and acre based on contemporary seeding rates.

Major contemporary *Bt* corn events targeting the ECB synthesize nearly as much or more insecticidal Cry protein per hectare than the weighted-average rate of conventional

Table 2 *Bt* cry protein synthesis in major GE corn cultivars

	Cry Protein	Cry/Shoot	Cry/Root	Cry/Plant	Plants per hectare	Cry Toxin kg /ha	Plants per Acre	Cry Toxin lb/acre
MON 810	Cry1Ab	1193	496	1689	79,040	0.133	32,000	0.119
MON 88017	Cry3Bb1	14915	4030	18945	79,040	1.497	32,000	1.333
MON 89034	Cry1A.105	2826	620	3446	79,040	0.272	32,000	0.242
MON 89034	Cry2Ab2	4553	496	5049	79,040	0.399	32,000	0.355
TC 1507	Cry1F	1207	165	1372	79,040	0.108	32,000	0.097
DAS 59122	Cry34Ab1	26376	2647	29023	79,040	2.294	32,000	2.042
DAS 59122	Cr35Ab1	5825	567	6392	79,040	0.505	32,000	0.45
SmartStax Corn								
MON 88017	Cry3Bb1	7536	2015	9551	79,040	0.755	32,000	0.672
MON 89034	Cry1A.105	2983	651	3634	79,040	0.287	32,000	0.256
MON 89034	Cry2Ab2	4553	558	5111	79,040	0.404	32,000	0.36
TC 1507	Cry1F	1413	185	1598	79,040	0.126	32,000	0.112
DAS 59122	Cry34Ab1	24649	2623	27272	79,040	2.156	32,000	1.918
DAS 59122	Cr35Ab1	5275	586	5861	79,040	0.463	32,000	0.412
SmartStax Total						**4.191**		**3.73**

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

insecticides applied on a hectare planted to *Bt* corn for ECB control (about 0.15 kgs insecticide per ha; 0.13 pounds/acre in 2010 [Additional file 1: Table S11]). MON810, the Cry protein in Monsanto's original Yieldgard corn, expresses 0.2 kgs/ha of endotoxin, whereas Syngenta's *Bt* 11 synthesizes 0.28 kgs/ha [Additional file 1: Table S22]. Newer events for ECB control like Monsanto's Genuity VT Double PRO (MON 89034) produce Cry 1A.105 and Cry 2Ab2 endotoxins totaling 0.62 kgs/ha. The Dow AgroSciences-Pioneer Hi-Bred Herculex I (TC1507) event expresses the least endotoxin – 0.1 kg *Bt* endotoxin per hectare – just below the rate of insecticides applied.

In the case of *Bt* corn targeting the CRW, every hectare planted in recent years expresses substantially greater volumes of *Bt* endotoxins than the ~0.2 kgs of insecticides applied on the average hectare for CRW control (0.19 pounds/acre [Additional file 1: Table S12]). MON 88017 expresses 0.62 kgs/ha of Cry 3Bb1, while DAS 59122–7 expresses two Cry proteins totaling 2.8 kgs/ha, 14-fold more than the insecticides displaced [Additional file 1: Table S22]. SmartStax GE corn synthesizes six Cry proteins, three targeting the ECB, and three the CRW. Total Cry protein production is estimated at 4.2 kgs/ha (3.7 pounds/acre), 19-times the average conventional insecticide rate of application in 2010.

Should Bt endotoxins count as insecticides applied?

Entomologists are divided on the question of whether the *Bt* produced by transgenic plants should be counted as "insecticides applied." The case for doing so is strong, despite the obvious differences in how Cry proteins enter corn agroecosystems. When a field of corn is sprayed with a foliar *Bt* insecticide, the amount of toxin sprayed per hectare should be counted when computing total insecticide use. The primary difference between the *Bt* Cry proteins in a *Bt*-transgenic plant, and a field of non-GE plants sprayed with foliar *Bt*, is that in the later case, the toxin is present predominantly on plant tissue surfaces, whereas in the former *Bt*-crop case, the toxin is inside plant cells. This distinction does not greatly matter from the perspective of the overall load of pesticides in the environment, although the presence of pesticides inside plants, as opposed to on their surface, alters relative risk profiles across non-target organisms.

It should also be noted that, in general, the systemic delivery of *Bt* Cry proteins poses more significant risks to animals and humans ingesting *Bt* crops than applications of *Bt* insecticides via liquid sprays. Systemic delivery also enhances a range of environmental and ecological risks [47] compared to foliar *Bt* use patterns that result in rapid breakdown of *Bt* Cry proteins as they are exposed to sunlight and rainfall.

Most corn insecticides are applied in ways that expose active ingredients to destructive abiotic and biotic forces that tend to break down the chemicals to generally less toxic forms. Granular soil insecticides applied via boxes on corn planters tend to break down within weeks as a result of soil microbial activity. Because properly applied granular insecticides are buried in the soil, exposure to non-target organisms is limited, although poorly operated or calibrated planting equipment can result in grains of insecticide remaining on the soil surface, posing a serious potential risk to some bird species. A significant portion of the foliar insecticides applied per hectare for ECB control never hit its plant target, and a portion of the insecticide that does land and lodge on plant tissues is washed off within hours, days, or weeks during rainfall events. This is why insecticide residues are rarely detected in corn grain and silage at harvest time, and why conventional insecticide applications on corn pose little or no human dietary risk.

By virtue of their altered environmental fate and risk profile, all systemic pesticides should be counted when measuring pesticide use, and hence so too should the *Bt* proteins manufactured in *Bt*-transgenic crops. If *Bt*-transgenic plants produced proteins that disrupted insect morphology, feeding behavior, or reproduction, the absence of a toxic mode of action would strengthen the argument that *Bt* Cry proteins are not functionally equivalent to insecticides, and hence should not be counted as insecticides applied. *Bt*-crop technology that limits *Bt*-endotoxin expression to only those tissues that are under active attack, and then only during times when insects are actively feeding, would also support the view that *Bt* crops are compatible with IPM.

Conclusions

Today's pest-management related GE traits have proven popular and commercially profitable for the biotech-seed industry, but over-reliance has set the stage for resistance-driven problems in both herbicide-resistant and *Bt*-transgenic crops. Largely because of the spread of glyphosate-resistant weeds, HR crop technology has led to a 239 million kg (527 million pound) increase in herbicide use across the three major GE-HR crops, compared to what herbicide use would likely have been in the absence of HR crops. Well-documented increases in glyphosate applications per hectare of HR crop account for the majority of this 239 million kg increase.

While *Bt* corn and cotton have reduced insecticide applications by 56 million kgs (123 million pounds), resistance is emerging in key target insects and substantial volumes of *Bt* Cry endotoxins are produced per hectare planted [corn, Additional file 1: Tables S20–S22, cotton, Additional file 1: Tables S23–S25], generally dwarfing the volumes of insecticides displaced. Documenting the

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

full range of impacts on the environment and public health associated with the *Bt* Cry proteins biosynthesized inside *Bt*-transgenic plants remains a challenging and largely ignored task, especially given the recent move toward multiple *Bt* protein, stacked-trait events.

Overall, since the introduction of GE crops, the six major GE technologies have increased pesticide use by an estimated 183 million kgs (404 million pounds), or about 7%. The spread of GR weeds is bound to trigger further increases, e.g., the volume of 2,4-D sprayed on corn could increase 2.2 kgs/ha by 2019 (1.9 pounds/acre) if the USDA approves unrestricted planting of 2,4-D HR corn [Additional file 1: Table S19]. The increase in herbicides applied on HR hectares has dwarfed the reduction in insecticide use over the 16 years, and will almost surely continue to do so for several more years.

Estimating the impacts of GE crops on pesticide use is growing more complex because of gaps in NASS pesticide use data collection for the three major crops, increases in the average number of traits per GE-crop hectare planted, the registration of HR crops engineered to resist herbicides other than glyphosate, massive disruption in weed communities, and the presence of one to three, or even more, glyphosate-resistant weeds in many crop fields. It is difficult to project what the distribution, population levels, and phenotypes of weeds would have been over the last 16 years in the absence of HR technology. Inevitably, weed management systems and technology would have evolved along other trajectories in the absence of HR crops these last 16 years, resulting in heightened reliance on both preplant and post-emergence applications of multiple, low-dose herbicides.

A majority of American soybean, maize, and cotton farmers are either on, or perilously close to a costly herbicide and insecticide treadmill. Farmers lack options and may soon be advised, out of necessity, to purchase HR crop cultivars resistant to multiple active ingredients and to treat *Bt* corn with once-displaced corn insecticides. The seed-pesticide industry is enjoying record sales and profits, and the spread of resistant weeds and insects opens up new profit opportunities in the context of the seed industry's current business model. Regulators cannot restrict the use of a previously approved HR technology because it increases pesticide use and triggers resistance, nor have U.S. government agencies turned down an application for a new HR or *Bt*-transgenic trait because of the likelihood it would accelerate the spread of resistant weeds or insects. Whether the USDA has the statutory authority to deny a petition for HR crop deregulation (i.e., approval) on the grounds of worsening problems with resistant weeds is a contested issue in ongoing litigation.

Profound weed management system changes will be necessary in the three major GE crops to first stabilize, and then hopefully reduce herbicide use, the costs of weed management, and herbicide-related impacts on human health and the environment. Weed management experts are largely in agreement that the percent of cropland area planted to glyphosate-based HR seeds must decline dramatically (e.g., by at least one-third to one-half) for farmers to have a realistic chance at success in preventing resistance [10,12,14]. Unfortunately, there appears little interest across the seed-biotech industry in increasing production of non-Roundup Ready or not-*Bt* transgenic seed. Since the decisions made by the seed industry in any given year determine the traits offered by the industry to farmers in next crop season, the seed industry must act first in order for farmers to turn the corner toward more sustainable weed and insect pest management systems. The many important ramifications of this practical reality – that the seed industry must act first – have yet to be fully appreciated by farmers, weed management experts, and policy makers in the U.S.

Regulators in the U.S. have thus far done little to prevent the emergence and spread of resistant weeds, while several resistance-management interventions have been imposed as part of the approval of *Bt* crops. In addressing weed resistance, the hands-off regulatory posture in the U.S. reflects, in part, the basic authorities granted to the EPA and USDA in federal law. Both agencies regard weed resistance as an efficacy-economics challenge that can best be addressed by the private sector consistent with market forces. The need for novel policy interventions will grow in step with the emergence and spread of resistance weeds and evidence of adverse economic, environmental, and public health consequences triggered by markedly increasing reliance on older, higher-risk berbicides.

Methods

The model calculates the impact of HR and *Bt*-transgenic crop varieties on pesticide use annually from 1996 through 2011, and aggregates results over this 16-year period. The model is composed of 16 tables [Additional file 1: Tables S1–S16]. Nine additional tables, [Additional file 1: Tables S17–S25] address changes in pesticide use, the spread of resistant weeds, and the quantity of *Bt* endotoxins produced per hectare by today's major corn and cotton *Bt* traits.

The model was developed using the units of measure typical in USDA-NASS surveys (pounds of active ingredients, acres planted); the Additional files are available in pounds and acres units only. In this paper, metric units are used to report results, although selected key results will be reported in both units of measure.

[Additional file 1: Table S1] records average per acre herbicide and insecticide use data, drawing on pesticide use data compiled annually by the USDA's NASS. These surveys record the percent of crop acres treated with

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

specific active ingredients, average one-time rates of application, the average number of applications, the rate per crop year (average rate multiplied by the average number of applications), and total pounds applied.

In the case of herbicides, [Additional file 1: Table S1] reports total herbicide, all glyphosate, and "Total Herbicides Minus Glyphosate." "All Glyphosate" aggregates the multiple chemical forms of glyphosate surveyed by NASS, and calculates average rates of application and number of applications, weighted by frequency of use. The same procedure is used to calculate average pounds/acre applied of other herbicides of interest for which NASS reports use data for multiple chemical forms (e.g. 2,4-D, dicamba). [Additional file 1: Table S2] includes national acres planted to each crop, average pesticide use rates, and total pounds applied per acre and overall herbicide, insecticide, and herbicide + insecticide volumes applied.

[Additional file 1: Tables S3–S6] record the percent of national acres planted to a crop variety expressing each of the six, major commercial GE traits. The USDA's ERS provides data on the percent of total national corn [Additional file 1: Table S3], soybean [Additional file 1: Table S4], and cotton hectares [Additional file 1: Table S5] that were planted to each GE crop trait for 1996–2011. Percent acres planted to all six GE traits by year are presented in [Additional file 1: Table S6]; there is a high level of confidence in these data.

[Additional file 1: Table S7] reports acres planted to each of the six traits, multiplying the percent acres planted to each trait in ST 6 by total acres planted to each crop in [Additional file 1: Table S2]. [Additional file 1: Tables S8–S10] calculate, for the three HR crops, the estimated difference in average herbicide use on HR hectares versus land planted to conventional, non-GE varieties. [Additional file 1: Tables S11–S13] report the basis for calculating the pounds of insecticides displaced by the planting of *Bt* corn and cotton traits. [Additional file 1: Table S14] integrates all of the average per acre pesticide use rates by crop, trait and year, and reports the estimated difference between per acre rates on GE versus non-GE acres. [Additional file 1: Table S15] converts the differences in rates per acre to differences in pounds applied nationally by crop, trait, and year, and over the 16-year period. [Additional file 1: Table S16] provides details on glyphosate use from NASS surveys over the 1996–2010 period, and is the source of data on glyphosate use in other Additional files.

Assumptions, projections, and calculations

A series of assumptions, projections, and calculations are embedded in the model in order to estimate total herbicide and insecticide use on GE versus not-GE hectares. Table 3 outlines model assumptions and Table 4 describes the projections embedded in the model's calculations.

NASS surveyed corn, soybean, and cotton pesticide use in most years from 1996–2010. None of the crops were surveyed in 2008; cotton was last surveyed in 2007 and 2010; corn was surveyed in 2005 and 2010; and soybeans have not been surveyed since 2006. In estimating the impacts of GE crops on pesticide use from 1996–2011, average application rates per crop year were interpolated in years with no data, when NASS had surveyed a previous and subsequent year, based on the assumption of linear change in the intervening years.

It is assumed that changes in the volume of herbicides other than glyphosate applied on the average HR hectare tracks changes in total herbicide use, and also changes gradually from year-to-year. With few exceptions, these

Table 3 Data sources and assumptions required to quantify the impact of GE crops on pesticide use in the U.S., 1996-2011

Parameter	Source	Supplemental table impacted	Basis and explanation
National Pesticide Use per Acre/Hectare	NASS-USDA	1, 2	Best publicly available estimates of annual per acre herbicide and insecticide use
Annual Gaps in NASS Survey Data by Crop	Interpolated	1, 2	Changes in total herbicide, glyphosate, and insecticide use occur linearly/annum when there are gaps in NASS pesticide use surveys
Annual Application Rates of "Other Herbicides on HR Hectares"	(See Table 4)	8, 9, 10	Trends by crop on HR acres track changes in total herbicide use, as reported by NASS; changes from year to year are gradual
Bt Cry Proteins Produced by *Bt* Corn and Cotton Plants	Projected (see text, Additional files)	20-25	Trait-specific expression levels by tissue taken from documents submitted by technology developers; used to quantify volume of each *Bt* endotoxin produced by plants per acre/hectare based on typical planting density
Insecticide Use on *Bt* Corn	(Details in Table 4)	11, 12	Insecticide displacement as a result of planting *Bt* corn corrected for hectares not likely to have been treated in the absence of *Bt* corn cultivars
Insecticide Use on *Bt* Cotton	NASS-USDA	13	Budworm/bollworm control insecticide displacement on hectares planted to *Bt* cotton is 100%

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

patterns of change in herbicide use are evident in all crops surveyed by USDA. Significant annual changes in total herbicide use, as well as non-glyphosate applications, are almost always linked to an increase or decrease in acres treated with one or more relatively high-dose herbicides applied at or around 1 pound/acre, compared to use of herbicides applied at rates less than 0.5 pound/acre (several are sprayed at rates below 0.05 pounds/acre).

The volumes of *Bt* Cry endotoxins produced per acre/hectare of *Bt* corn and cotton are not included in the estimates of changes in insecticide use on acres/hectares planted to *Bt* cultivars, although the volumes are surprisingly significant compared to the volume of insecticides applied on treated acres/hectares (see "Discussion"). In the case of insecticide use on *Bt* corn, the volume of insecticide use displaced per acre/hectare is adjusted in light of the likely percent of *Bt* corn acres/hectares that would have been treated with an insecticide in the absence of *Bt* cultivars. Multiple analysts have reported substantial planting of *Bt* corn as insurance against possible insect feeding damage, on acres/hectares that farmers would not prophylactically apply insecticides [4,13]. In a January 2010 survey, 73.3% of 518 farmers surveyed at regional extension meetings in Illinois reported that they planted *Bt* corn "Knowing That Anticipated Damage Levels Were Low" [48]. USDA has surveyed corn insecticide use 14 times since 1991. The total area treated with an insecticide has fallen in the range 31% +/− 5% in all years, with the average around 33%.

It is assumed that farmers planting *Bt* cotton do not spray conventional insecticides against the budworm/bollworm complex of insecticides, leading to 100% displacement of such applications. This assumption likely overestimates displacement marginally, especially in recent years where isolated populations of less susceptible or resistant populations have emerged.

Table 3 describes the basis for projecting a number of missing values over the 1996-2011-time period. In the years since the last NASS survey, pesticide rates were projected based on recent trends and changes in weed pressure.

In the case of corn, total herbicide and glyphosate use trends from 2005–2010 are projected to continue unchanged through 2011, despite the accelerating emergence and spread of resistant weeds in the Midwest. The rapid rate of increase in total herbicide and glyphosate use/acre in soybean production systems from 2000–2006 (5.9% and 8.9%/annum) is projected to decline to an average increase of 3.2% and 3.3% per annum in 2007–2011. Reductions in annual rates of increase reflect the decision by many HR soybean farmers to follow the advice of weed management specialists [10,11] to diversity the modes of action included in herbicide-based control programs. The rate of increase in total herbicide use on HR cotton from 2010 to 2011 is projected at about twice the annual rate, 2007–2010, whereas the rate of decline in per hectare glyphosate use is projected to fall from −3.4% to −1% per annum as farmers increase rates and/or frequency of applications of glyphosate in regions where resistant weeds are now posing serious management challenges.

Estimating herbicide use on conventional and HR hectares

NASS surveys do not report pesticide use on GE and conventional crop hectares separately.

The volume of herbicides applied to HR hectares can be approximated by adding NASS-reported glyphosate use

Table 4 Projections required quantifying the impact of GE crops on insecticide use in the US, 1996–2011

Parameter	Supplemental table(s) impacted	Basis for setting value	Basis and explanation
Corn			
Share of Insecticide Applications Targeting the European Corn Borer (ECB) Versus Corn Rootworm (CRW)	11, 12	Guidance from extension IPM specialists and land grant university spray guides	Some insecticides applied exclusively for control of ECB, others for control of CRW; and some target both. The percent hectares treated with a given insecticide are apportioned relative to target pests: ECB, CRW, or other insects.
"Other Insecticides" Applied in 2010 for ECB Control	11	NASS data on "Other Insecticides" applied in 2010	NASS reported 237,000 pounds of "Other Insecticide" use in 2010; 30% of these "Other Insecticides" applied to corn in 2010 projected to target the ECB.
"Other Insecticides" Applied in 2010 for CRW Control	12	NASS data on "Other Insecticides" applied in 2010	NASS reported 237,000 pounds of "Other Insecticide" use in 2010; 60% of "Other Insecticides" applied to corn in 2010 projected to target the CRW.
Cotton			
Share of Insecticide Applications Targeting the Budworm/Bollworm Complex	13	Guidance from extension IPM specialists and land grant university spray guides	Some insecticides applied exclusively or partly for control of the budworm/bollworm complex, others for other insects; percent hectares treated with a given insecticide is apportioned relative to target insects.

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

per crop year to an estimate of the volume of herbicides other than glyphosate (hereafter, "other herbicides") applied on HR hectares. The volume of "other herbicides" applied on HR hectares is estimated based on the average number of non-glyphosate herbicides applied per hectare, coupled with the average rate per application of non-glyphosate herbicides. In addition, the rate of "other herbicides" on HR hectares is adjusted to reflect changes from year to year in overall herbicide use and glyphosate application rates. For example in recent years, "other herbicides" have been applied to around one-half of HR soybean hectares at an average rate of ~0.34 kgs/ha (~0.3 pounds/acre), resulting in an average ~0.17 kgs/ha (~0.15 pounds/acre) of "other herbicide" applications on all HR hectares (0.5 × 0.34).

The shares of total crop hectares in a given year planted to conventional and HR crop varieties is compiled by the USDA's ERS [Additional file 1: Tables S3–S5] and can be used in a weighted-average formula to calculate the kgs of herbicides applied on non-HR hectares –

$$THA\ \ Crop_x = [(\%HPHT_x)x(HAHT_x)] + [(\%HPCON_x)x(HACON_x)]$$

Where,

THA $Crop_x$ = "Total Herbicides Applied" (kgs active ingredient/hectare in a crop year);

% $HPHT_x$ = Percent national "Hectares Planted to HR" cultivars;

$HAHT_x$ = "Herbicides Applied on HR" hectares (kg a.i./crop year);

% $HPCON_x$ = Percent national "Hectares Planted to Conventional" non-HR hectares; and

$HACON_x$ = "Herbicides Applied on Conventional" hectares (kgs a.i./crop year).

The first four of the above-five variables are reported or can be derived from USDA data; the fifth can be calculated by solving the above equation for $HACON_x$. For each HR crop and year combination, the impact of HR cultivars on average herbicide use is calculated by subtracting $HAHT_x$ from $HACON_x$. This difference is then multiplied by the HR hectares planted, to calculate the impact of HR crops on herbicide use in a given year. Increases or decreases in the volume of herbicides applied as a result of the planting of HR crops are then aggregated across all years (1996–2011) and the three HR crops.

In the case of *Bt* transgenic corn, the average rate of application of insecticides targeting the ECB and the CRW must be calculated. This process is complicated by the fact that several insecticides are applied for control of the ECB and CRW, as well as other insects. Pesticide labels, treatment recommendations in university spray guides, and experts in corn Integrated Pest Management (IPM) were consulted in carrying out this step [Additional file 1: Tables S11, S12].

Average rates of insecticide application across all corn hectares treated per crop year are then calculated, weighted by portions of total hectare treatments. This weighted-average rate of insecticide application on hectares treated for ECB control declines from 0.24 kgs/ha (0.21 pounds/acre) of active ingredient in 1996 to 0.15 kgs/ha (0.13 pounds/acre) in 2010. In the case of CRW insecticides, the rate falls from 0.76 kgs/ha in 1996 to 0.2 kgs/ha in 2010.

The next step in calculating the pounds of insecticides displaced by the planting of *Bt* corn is to estimate the portion of hectares planted to *Bt* corn for ECB and/or CRW control that would have been treated with an insecticide if the corresponding *Bt* crop had not been planted. Doing so requires a set of assumptions and projections.

Historically, USDA data shows that before the advent of *Bt* corn, 10% +/− 3% of national corn hectares were treated for ECB control, while 27% +/− 4% were treated for CRW control. Yet by 1998 (third year of commercial sales), 19% of corn hectares were planted to a *Bt* cultivar targeting the ECB – about double the historic share of hectares treated with an insecticide for this pest. Today, close to two-thirds of corn hectares are planted to *Bt* for ECB cultivars, some six-times the historic rate. In the case of *Bt* corn for CRW, by the fifth year of commercial sales, 2007, the share of corn hectares planted to CRW hybrids was 25.6%, roughly equaling the historic share of hectares treated with CRW insecticides (27% +/− 4%). In 2011, 60% of corn hectares were planted to a CRW hybrid, double the historic share of corn hectares treated with a CRW insecticide.

The impact of *Bt* corn on the volume of insecticide displaced per hectare should be adjusted downward to account for hectares that would, in all likelihood, not have been treated. In the case of *Bt* corn targeting the ECB, the likely share of hectares planted to *Bt* corn that would have been sprayed for ECB control begins at 90% in 1997, the first year of commercial planting, and drops incrementally to 45% in 2007.

This percent is left unchanged from 2008–2010, despite the increase in corn hectares planted to *Bt* corn for ECB from 49% to 65%, because of reported increases in insect pest pressure in major corn producing regions [49]. The result is the projection that in 2011, insecticide applications were displaced on 10.9 million hectares of corn (27 million acres) planted to *Bt* hybrids for ECB control (45% of the 65% of corn hectares planted to *Bt* for ECB hybrids). These 10.9-million hectares are 29% of total corn hectares planted, and is about three-times the historic level of insecticide applications for ECB control.

In the case of *Bt* corn for CRW control, the percent of hectares planted that displaces insecticide use begins at 95% in 2003, the first year of commercial sales, and

Benbrook *Environmental Sciences Europe* 2012, **24**:24
http://www.enveurope.com/content/24/1/24

declines to 55% in 2011. In 2011, 57% of corn hectares were planted to a *Bt* CRW hybrid, and hence *Bt* corn for CRW displaced insecticide use on 31% of national hectares planted. This estimate assumes that any hectare planted to a *Bt* corn for CRW control was not also treated with a CRW insecticide. In addition, 9.4% of corn hectares were sprayed for CRW control with an insecticide. Accordingly, about 40% of corn hectares were either sprayed for the CRW or planted to a *Bt* variety for CRW control, well above the 27% +/− 4% level treated with insecticide over the last 20 years.

The historically high, projected level of CRW treatment is justified, in part, by the emergence in the late 1990s of a variant of the CRW that learned to overwinter in soybean fields, thus undermining the efficacy of corn-soybean rotations in reducing CRW populations [50]. Recent, historically high corn prices have also increased the frequency of continuous corn, a management factor that surely has increased CRW pressure.

Bt cotton targets the budworm/bollworm complex, but does not affect other insect pests, including the boll weevil, plant bugs, white flies, and stinkbugs. Applications of broad-spectrum insecticides are typically made on essentially 100% of planted cotton hectares to control the budworm/bollworm complex and other insects. *Bt* cotton will reduce the use of insecticides on the budworm/bollworm complex, but will only indirectly impact applications of insecticides targeting other insects.

[Additional file 1: ST 13] reports the basis for estimating the pounds of insecticides displaced by each acre planted to *Bt* cotton. University insect management guides and experts were consulted to estimate the portion of hectares treated with each cotton insecticide that targeted the budworm/bollworm complex, versus other insects. The number of acres treated with each insecticide is calculated from NASS data, as well as the share of total acres treated. Average insecticide use rates are then calculated, weighted by each active ingredient's share of insecticide acre treatments targeting the budworm/bollworm complex. The weighted average cotton insecticide application rate falls modestly from 0.46 kgs/ha (0.41 pounds/acre) in 1997 to 0.27 kgs/ha (0.24 pounds/acre) in 2010–2011.

Table 4 summarizes the basis for projections required to estimate the volume of insecticide use displaced by the planting of a hectare to *Bt* corn or cotton cultivars.

Additional file

Additional file 1: The projection model used is composed of a series of linked worksheets in a Microsoft Excel workbook. Each table within the workbook appears below in pdf as sequentially numbered Additional file 1: Table S1 (e.g., ST 1). The pesticide use data incorporated in the model were originally reported by U.S. government agencies in pounds of active ingredient, and/or pounds of a.i./acre, and so these units are used throughout the Additional files to report data on herbicide use. Convert pounds to kgs by multiplying by 0.454, to convert pounds/acre to kg/ha, multiply by 1.12.

Abbreviations

AI: Active ingredient; *Bt*: Bacillus thuringiensis; CRW: Corn rootworm; ECB: European corn borer; EPSPS: Enolpyruvylshikimate-3-phosphate synthase; EPA: Environmental Protection Agency; ERS: Economic Research Service; GE: Genetically engineered, genetic engineering; GR: Glyphosate resistant; ha: Hectare; HR: Herbicide Tolerant; IPM: Integrated Pest Management; kgs: Kilograms; NASS: National Agricultural Statistics Service; NCFAP: National Center for Food and Agriculture Policy; RR: Roundup Ready; SI: International System of Units; ST: Supplemental Table; THA: Total hectares; US: United States; USDA: United States Department of Agriculture; WSSA: Weed Science Society of America.

Competing interests

The author declares he has no competing interests.

Author contribution

Charles Benbrook (CB) developed the model, carried out the analysis, and wrote the paper. The author read and approved the final manuscript.

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Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Mr. Gregory Jaffe

Senator Sherrod Brown

1. In your testimony, you focused on the need to improve the regulatory structure as it relates to biotech. If this is done, do you see a need for mandatory labeling? Why/why not?

CSPI believes that FDA's oversight of genetically engineered (GE) crops needs to be improved through federal legislation that would establish a mandatory pre-market approval process. That regulatory process would ensure that GE crops are safe and would provide consumers with confidence that they can eat foods and ingredients from those crops. Even if Congress enacts a FDA mandatory pre-market approval process, the food industry still needs to become more transparent by providing consumers with information about whether food products contain ingredients that came from a GE crop. That information could be provided through a variety of mechanisms, such as the company's website, the food's label, or in written material about the product distributed at the point of sale. Companies could also make that information accessible to consumers through the product's bar code or QR code. Mandatory labeling requirements primarily should be used to convey food safety or nutritional information that directly impact the health of the consumer.

2. From your perspective, how would the relevant federal agencies ensure that consumers have the information to know what a "GE" label would mean?

Many consumers do not have an adequate or accurate understanding about what "genetic engineering" means, why GE crops have been developed, how those crops enter our

food supply, and whether they are safe to eat. If consumers are provided with information about genetic engineering on a label, the federal government would need to conduct an educational campaign so that consumers understand the information being provided to them. The specific way to educate consumers and the information that should be provided by the relevant federal agencies is not within my area of expertise.

3. In your testimony, you noted your belief that USDA's legal authority, its "hook," was too narrow for regulating GE crops. Do you see a future in which USDA's would then be unable to fulfill its historic role in the regulatory process?

Yes, if USDA continues to regulate only GE crops that could become a "plant pest," then more and more GE crops could avoid USDA oversight in the future.

4. One difficulty in updating the regulatory framework around GE foods would be properly defining what it means for a food to be "genetically engineered." Do you have any considerations as to what a new definition might look like?

It is important that the definition of a food that is "genetically engineered" be consistent with international documents, such as the Cartagena Biosafety Protocol and the Codex Alimentarius international food standards.

Senator John Thune

1. CSPI does not support the "Safe and Affordable Food Act" (H.R. 1599) because you say it does not provide an adequate mechanism to ensure that the crops are safe.
   What would your recommended changes be to this legislation that would ensure there is an adequate mechanism to ensure the crops are safe?

Instead of providing new authority to the Secretary of Agriculture to ensure a GE crop developer completes FDA's voluntary consultation process, the legislation should amend the Federal Food, Drug and Cosmetic Act to establish a mandatory pre-market approval process for GE crops. That approval process would contain four components: (1) FDA oversight would be required for all GE food crops, irrespective of their intended use; (2) the process would be mandatory, not voluntary; (3) FDA would provide the developer and the public with its opinion on the safety of the GE crop; and (4) the burden of proof to ensure safety would fall on the GE crop developer.

2. Do you believe that mandatory GMO labeling is the only way to ensure consumers can get the adequate information about their food?

CSPI believes that any information about whether a food or its ingredients came from a GE crop must be accurate, neutral, and not misleading. Such information could be provided using a number of different vehicles, including but not limited to, on the food's label, on the product's or manufacturer's website, in brochures and written materials available at the point of purchase, or through the food product's bar code or QR code.

Senate Committee on Agriculture, Nutrition & Forestry
"Agriculture Biotechnology: A Look at Federal Regulation and Stakeholders Perspectives"
Questions for the Record
Mr. William Jordan
Wednesday, October 21, 2015

Chairman Pat Roberts

Roberts 1. Mr. Jordan, during the hearing you mentioned EPA's efforts related to the Worker Protection Standards rule. While I support efforts to address valid safety issues, I generally have concerns with efforts to add regulatory burdens for farmers and ranchers without clear benefits. In particular, I am curious under what statutory authority EPA worked with the Department of Labor (DOL) in developing the updated Worker Protection Standards and what role DOL played in the process. Can you also describe USDA's role in the rulemaking process and efforts made to address any issues that might have been raised? And, finally, what efforts has EPA taken to engage state agencies, producers, and others in the agriculture community in a meaningful conversation to ensure growers and others have the necessary information to maintain compliance with requirements?

Answer: The U.S. Environmental Protection Agency (EPA) issued revisions to the Worker Protection Standard (WPS) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. 136-136y, particularly 7 U.S.C. 136w(a). The EPA consulted with the U.S. Department of Labor (DOL) before and during the interagency review process required under Executive Order 12866. The EPA sought the DOL's interpretation of the scope of its own authority under the Fair Labor Standards Act to protect child workers in agriculture. However, the EPA's mandate under FIFRA is significantly broader, requiring the EPA to prevent unreasonable adverse effects of pesticides on workers and other persons, and on the environment. The EPA engaged with the U.S. Department of Agriculture (USDA) throughout the development of the proposed and final rules. The USDA reviewed the final rule and provided comments to the EPA under review mandated by FIFRA Section 25, 7 U.S.C. 136w, and again as part of the Executive Order 12866 interagency review process coordinated by the Office of Management and Budget (OMB). The EPA addressed comments from the USDA during both of these review processes, through both discussions and written responses. The EPA did amend some portions of the final rule to address issues raised by the USDA, e.g., expanded the immediate family exemption and clarified some definitions. The USDA's comments under the FIFRA review and the EPA's responses are available in the docket for this rulemaking.

The EPA delayed implementation of almost all of the revised WPS requirements for one year to allow time to get information out to stakeholders about the revised regulation and compliance requirements. The EPA developed an implementation plan for the final rulemaking that includes extensive outreach to state agencies, producers, and the agricultural community related to the revised WPS requirements, development of resources such as a "How To Comply with the WPS" guidance document and pocket guide to understanding the regulation, and materials that growers and others can use to provide safety training to their workers and handlers. The EPA actively engages with state regulators and inspectors through face to face meetings, webinars,

and conference calls to ensure that the EPA is fully aware of what compliance assistance activities and materials would be most beneficial and also to ensure that the regulated community is aware of the updated rule and available resources.

Roberts 2. During the hearing, I was pleased to hear APHIS, EPA, and FDA testify that the White House Office of Science and Technology Policy (OSTP) review of the Coordinated Framework for the Regulation of Biotechnology will inform their consideration of how to best improve the regulation of plant biotechnology for the future. I understand that each agency's plan will allow the White House review, including public meetings and opportunities for public comments, to inform regulatory considerations. I understand that this theme was also expressed by thirteen farmer, scientific, and seed industry organizations in a letter calling for the White House to carefully consider regulatory policy that will continue to protect health and the environment while not stigmatizing new technologies or unnecessarily impeding innovation. What role will OSTP play in ensuring new regulations that impact the commercialization of new plant varieties are not introduced until the White House review has concluded? What assurances can you offer that the OSTP review process will inform the regulatory agencies' considerations for plant biotechnology?

Answer: The update of the Coordinated Framework and the development of a long term strategy to ensure that the Federal regulatory system is well equipped to assess efficiently the risks, if any, associated with future products of biotechnology is being undertaken by an interagency Biotechnology Working Group under the Emerging Technologies Interagency Policy Coordination Committee (ETIPC) with representatives from the Executive Office of the President, as well as the EPA, Food and Drug Administration (FDA), and the USDA. The USDA's Animal and Plant Health Inspection Service (APHIS) actively participates in this interagency working group. The EPA does not intend to initiate any rulemaking that impacts the commercialization of new plant varieties until the interagency group's efforts to develop an updated Coordinated Framework, and formulate a long term strategy are completed (expected by the summer of 2016). The interagency process will inform the EPA's considerations for plant biotechnology.

Senator Joni Ernst

Ernst 1. Is your agency successfully ensuring food derived from biotech crops is safe for humans and animals to consume?

Answer: Yes. At the EPA, we are very confident in the judgments we made about the safety of the Plant-Incorporated Protectants (PIPs) that we reviewed. The PIP products, like all pesticides, must meet the same rigorous safety standard. The EPA requires companies to give as much data as we need to make that decision.

Ernst 2. Would you agree that available studies suggest that biotech crops that have successfully completed the U.S. regulatory process have, in fact, had some very positive effects on the environment, including reduced chemical inputs and improved water quality?

Answer: Yes. A number of groups, ranging from academicians to the federal government to the National Academy of Sciences, studied how the introduction of PIPs affected the use of synthetic chemical pesticides. These experts concluded that by planting PIPs, growers reduced by more than a third – many millions of pounds – their reliance on broad spectrum, synthetic insecticides. The result is reduced exposure to such pesticides for workers and non-target wildlife, less ground and surface water contamination by such pesticides, and less residue of such pesticides in food.[1]

Ernst 3. Mr. Jordan - Recently, there has been some buzz about glyphosate's safety for use as a pesticide, due to the International Agency for Research on Cancer's classification, even though we have been using this product safely for decades, and there isn't a single regulatory agency worldwide that considers it to be a carcinogen. Does the EPA believe that glyphosate is safe to use within the prescribed label requirements?

Answer: We are currently reassessing glyphosate and expect to publish for public comment draft human health and ecological risk assessments in the next several months.

Senator Heidi Heitkamp

Heitkamp 1. I was happy to read in USDA's testimony that they're making an effort to speed up-while maintaining the scientific integrity-of the approval process. I think this is absolutely critical to foster innovation. As a witness on the second panel mentions, we do have some issues with weed resistance. This is true in North Dakota, but there are ways to mitigate resistance, and one of those is to provide new tools in our farmers' toolboxes to combat resistance. We've heard the stories of products taking 4 years at USDA and even longer at EPA to get approval-some of which are still waiting the go-ahead. What is EPA doing to streamline its process to make sure producers have access to a more diverse set of options to mitigate current resistance issues and hopefully slow down future resistance?

Answer: The EPA recognizes the negative impacts of weed resistance and understands growers' needs for new weed control technology. Herbicides to be used on crops genetically modified to tolerate the chemical will provide new options for control of resistant weeds. The EPA's review of the use of such herbicides requires thorough and robust safety assessments for both human health and the environment. The agency's goal is to develop a review methodology that allows for regulatory decisions that are both timely and protective. The EPA intensified technical collaboration and information sharing with the USDA and other expert stakeholders in handling these actions. We are also building a framework for a streamlined review process for products that can reduce the spread of herbicide resistant weeds. Through these new strategies, the EPA hopes to promote a more efficient registration process that provides growers with safe, effective herbicide tools.

[1] Klumper,W and M. Qaim. (2014). A Meta-Analysis of the Impacts of Genetically Modified Crops, http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111629.

Senator Patrick Leahy

Leahy 1. Today, Brazil is the second largest producer of GE soy. The country has had a national requirement since 2004 that requires foods comprised of 1% or more GE components, must present on the product label a triangle on a yellow background with the letter "T" in the center and the expression "contains (name(s)) ingredient(s)) GM(s)." This is a mandatory, national label that simply, in a few words, conveys to consumers that the food contains GE products, but does so without any stigma about GE products. Since that Brazilian legislation was approved, to your knowledge, has there been a reduction in the consumption of GE foods in Brazil or an increase in their consumption?

Answer: The EPA does not have any information about the effect that the Brazilian labeling requirements regarding the presence of genetically engineered (GE) ingredients in food have had on consumption of foods with such labeling.

Senator David Perdue

Perdue 1. I am concerned that over the last decade new pests and weeds have cost Georgia cotton producers alone over $1 billion. The USDA has approved traits that would help alleviate the effects of these new varieties of weeds on Georgia cotton producers, but the EPA has not approved the herbicide that works in conjunction with the approved traits. How do we improve the process to make sure growers are getting pest and weed management tools more efficiently?

Answer: The EPA understands and appreciates crop producers' need for new weed control tools. To that end, the EPA is diligently working to complete its assessments of the pending applications for additional herbicides for cotton as quickly as possible. We place a high priority on supporting actions that can help combat weed resistance. More generally, we are working to build efficiencies and best practices into our regulatory decision making process, while maintaining our commitment to sound science and transparent decision making.

Perdue 2. More specifically, how do we improve the communication between regulatory agencies, academia and industry to ensure that we are getting producers the tools they need as quickly as possible?

Answer: In addition to collaborating with other federal agencies, the EPA is actively working to trouble shoot the issues of herbicide weed resistance with other experts as well. In particular, we have an extensive, ongoing engagement on this topic with state lead agencies, experts with agricultural extension, the Weed Science Society of America (WSSA), and industry. Among these groups, there is clear consensus that it is necessary for all of us to become more active in efforts to respond to the production issues posed by resistant weeds. The consensus is that while new pesticides are important, they alone are not the answer, and that education and other measures are needed. These are the kinds of things we are working on with states, extension, WSSA, and industry.

Senator Ben Sasse

Sasse 1. During the hearing you indicated that the average time for approvals of applications for registration submitted pursuant to the Pesticide Registration Improvement Act is about 15 to 18 months. On the EPA website there is a report titled, "Implementing the Pesticide Registration Improvement Act FY 2014". Within this report it states that EPA has developed an "improved tracking of pesticide registration decisions". The document states there is a "compiled spreadsheet of all conditional registrations issued since October 1, 1999". According to the "Decision Review Times for FY 2014" spreadsheet, several applications exceed 500 days. Please provide a list of products submitted in 2015, the date they were submitted, any tracking on the "milestones" met during the process, fees paid, public comments received, and EPA's estimated timeline for approval.

Response: The attached Tables 1 and 2 respond to the information requested. The information was extracted from the EPA's regulatory tracking data base and is current as of November 5, 2015. The "Reg Number" column lists the EPA registration number for each product. The "PRIA Start Date" column lists the date when the submission was deemed complete and the fee had been paid, which is when the decision review time period begins – typically 21 days or less after receipt of the application. The "Fee Paid" column shows the amount the applicant paid for that action. For actions that have been completed, the date of completion appears in the "Completed Date" column and the number of days it took to complete the action appears in the "Days to Complete" column. For actions that are still pending, i.e., where no date appears in the "Completed Date" column, the timeframe for completion appears in the "Days Remaining" column. The EPA has agreed to inform registrant contacts when any of their PRIA submissions reaches each of the seven defined tracking milestones. The EPA deployed the PRIA Pesticide Registration Milestone Tracking Email software upgrades in December 2013. The list of automated milestones can be found at http://www2.epa.gov/pria-fees/automated-email-milestone-tracking-pria-actions. The milestones are:

- Application receipt date; receipt number assigned;
- PRIA category(ies) assigned; waiver decision, if applicable, completed; payment completed; 21-day screen timeframe expired; PRIA start date; PRIA due date; pre-decisional determination due date, if applicable;
- Contact information for PM assigned to your application; date data sent into review;
- 45/90 technical screen timeframe expired;
- Actual last science review completion date;
- Pre-decisional determination date reached, if applicable; and
- Regulatory decision completed.

The three means by which public comment is solicited for PRIA applications are:

- Notices of Receipt – required for all registration applications submitted to the EPA involving a new active ingredient or a changed use pattern;
- Notices of Filing – required for all applications in which a petition for tolerance or tolerance exemption is submitted to the EPA; and

- Public Participation Process – it is EPA's policy to solicit public comment before registering products involving:
  - -- a new active ingredients;
  - -- a first food use;
  - -- a first outdoor use;
  - -- a first residential use; and
  - -- other actions of significant interest.

A full description of the public participation process can be found at http://www2.epa.gov/pesticide-registration/public-participation-process-registration-actions.

Senator John Thune

Thune 1. Mr. Jordan, in your testimony, when discussing regulation of plant-incorporated protectants or PIPs you provide, "our decisions are based on the best available science; we operate with consistency and fairness in a transparent manner; and we collaborate fully with our regulator partners in the Coordinated Framework."

You also provide, "The EPA believes we have a responsibility to convey to the public that our decisions are consistent, scientifically solid, and fully protective of human health and the environment."

Based on the collaborative efforts of EPA, FDA, and USDA/APHIS using sound science to ensure food safety, especially for foods derived from genetically engineered plants, do you believe consumers need a GMO label on foods derived from genetically engineered plants?

Response: Making regulatory decisions based on the best available science is the foundation of the EPA's decision making. The agency believes that it must be fully informed by the best available information and expert advice and follows several strategies to ensure that it is so informed. In addition, under the Coordinated Framework, the EPA works closely with the FDA and the USDA, using our regulatory authorities appropriately to ensure the safety of products of modern biotechnology. The EPA administers one section of the Federal Food, Drug and Cosmetic Act (FFDCA), section 408, which makes the EPA responsible for establishing tolerances or exemptions from the requirement of tolerance for pesticide residues in food or feed Other sections of the FFDCA, including those governing the labeling of food products, are administered by the FDA.

Thune 2. Mr. Jordan, opponents of biotechnology have been raising questions about the safety of glyphosate herbicide with certain GM crops, notwithstanding its 40-year history of safe use and the fact that no regulatory agency in the world considers glyphosate to be a carcinogen. In April of this year, EPA issued a desk statement regarding glyphosate and the IARC conclusion. In this statement, EPA stated, in part:

"In 2014, EPA reviewed over 55 epidemiological studies conducted on the possible cancer and non-cancer effects of glyphosate. Our review concluded that this body of research does not

provide evidence to show that glyphosate causes cancer, and it does not warrant any change in EPA's cancer classification for glyphosate. This is the same conclusion reached in 2004 by the United Nations' Food and Agriculture Organization and affirmed this year by Germany's pesticide regulatory officials."

Can you confirm that this is the most recent public statement EPA has issued addressing the safety of glyphosate?

Response: Regarding glyphosate, the EPA is nearing completion of a cancer review that included consideration of the International Agency for Research on Cancer (IARC) review. The EPA expects to release a draft risk assessment within the next few months.

Thune 3. During the hearing you indicated that that the average time for approvals of applications for registration submitted pursuant to the Pesticide Registration Improvement Act (PRIA) is about 15 to 18 months. By way of follow-up, please produce an itemized list of all registration applications completed within the last 12 months as well as currently pending registration applications (excluding "me-too" applications), at the Biopesticide and Pollution Prevention Division and the Registration Division, along with the date each of those original registration applications were submitted and a statement as to whether or not their pertinent deadlines have been renegotiated. If deadlines have been renegotiated, for each application, please state how many times they have been renegotiated.

Response: The attached tables provide the information requested. The information was extracted from the EPA's regulatory tracking data base and is current as of November 5, 2015.

Tables on EPA Pesticide Registration Applications
(data through November 5, 2015)

Table I
Status of PRIA Actions Submitted in FY2015
Biopesticides and Pollution Prevention Division (BPPD)

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
495396	B680	4822-528	10/06/2014	03/06/2015			84	12/29/2014	$4,863.00
495492	B590.0	90809-E	10/08/2014	03/08/2016	03/15/2016	134			$0.00
495493	B590.0	4F8313	10/08/2014	03/08/2016	03/15/2016	134			$0.00
495513	B670	84846-12	10/09/2014	05/11/2015			209	05/06/2015	$1,216.00
497071	B612.0	89046-G	10/14/2014	08/14/2015	02/21/2016	111			$0.00
495620	B681	67702-3	10/14/2014	05/14/2015			136	02/27/2015	$5,789.00
495489	B590	90809-R	10/15/2014	03/15/2016		134			$7,598.00
495952	B590	70644-T	10/15/2014	03/15/2016		134			$7,598.00
495956	B590.0	70644-L	10/15/2014	03/15/2016		134			$0.00
495960	B590.0	70644-A	10/15/2014	03/15/2016		134			$0.00
495954	B590.0		10/15/2014	03/15/2016		134			$0.00
495947	B660	73049-504	10/15/2014	02/17/2015			111	02/03/2015	$1,217.00
495946	B680	70127-10	10/15/2014	03/16/2015			146	03/10/2015	$4,863.00
495928	B683	73049-68	10/17/2014	04/17/2015			117	02/11/2015	$4,863.00
496110	B612	89046-U	10/21/2014	08/21/2015			104	02/02/2015	$4,179.00
496232	B670	91113-1	10/23/2014	05/26/2015			216	05/21/2015	$1,216.00
496415	B680	88889-1	11/04/2014	04/06/2015			139	03/23/2015	$4,863.00
496549	B772	524-EUP-104	11/04/2014	02/04/2015			92	02/04/2015	$12,156.00
496545	B670	6218-IL	11/13/2014	06/15/2015			180	05/12/2015	$1,216.00
496760	B885	67979-29	11/13/2014	08/13/2015			273	08/13/2015	$30,390.00
497006	B644	86868-L	11/19/2014	07/20/2015	11/19/2015	17			$12,156.00
497037	B680	88760-2	11/19/2014	04/20/2015			152	04/20/2015	$1,216.00
497033	B680	88760-1	11/19/2014	04/20/2015			152	04/20/2015	$1,216.00
496763	B720	90060-1	11/19/2014	04/20/2015			121	03/20/2015	$1,217.00
497108	B673	62355-8	11/26/2014	09/28/2015			301	09/25/2015	$4,863.00
497228	B660	264-1180	12/01/2014	04/01/2015			116	03/27/2015	$1,217.00
497259	B680	87663-1	12/01/2014	05/01/2015			52	01/22/2015	$1,216.00
497335	B680	89363-1	12/05/2014	05/05/2015			109	03/24/2015	$4,863.00
497668	B780	84427-R	12/09/2014	12/09/2015		37			$0.00
497738	B670	87193-1	12/16/2014	07/16/2015			206	07/10/2015	$1,216.00
497870	B682	89041PA1	12/22/2014	03/23/2015			35	01/26/2015	$2,409.00

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
497906	B672	82437-O	12/24/2014	01/25/2016		84			$2,171.00
495260	B673	70127-RI	12/25/2014	10/26/2015			288	10/09/2015	$0.00
495259	B673	70127-RT	12/25/2014	10/26/2015			288	10/09/2015	$0.00
495254	B673	73314-RL	12/25/2014	10/26/2015			288	10/09/2015	$0.00
495253	B673	73314-RU	12/25/2014	10/26/2015			288	10/09/2015	$0.00
495252	B673	73314-RG	12/25/2014	10/26/2015			288	10/09/2015	$0.00
495250	B673	73314-RR	12/25/2014	10/26/2015			-49	11/06/2014	$0.00
495250	B673	73314-RR	12/25/2014	10/26/2015			308	10/29/2015	$0.00
487782	B790.2	524-618	01/02/2015	07/05/2016			300	10/29/2015	$249,118.00
498435	B641		01/05/2015	02/05/2016		95			$12,156.00
498435	B641		01/05/2015	02/05/2016			37	02/11/2015	$12,156.00
498712	B643.0	4F8342	01/08/2015	11/09/2015	11/16/2015	14			$0.00
498594	B680	87663-3	01/12/2015	06/12/2015			10	01/22/2015	$1,216.00
498710	B643	86174-3	01/15/2015	11/16/2015		14			$3,039.00
498589	B660	1381-256	01/19/2015	05/19/2015			25	02/13/2015	$1,217.00
499001	B670	264-1183	01/20/2015	08/20/2015			204	08/12/2015	$4,863.00
499133	B720	36638-45	01/29/2015	06/29/2015			91	04/30/2015	$305.00
499026	B620	89285-EUP-2	01/30/2015	08/31/2015			132	06/11/2015	$6,079.00
499025	B620	89285-EUP-1	01/30/2015	08/31/2015			132	06/11/2015	$6,079.00
498696	B590	87645-E	02/04/2015	07/05/2016			147	07/01/2015	$7,598.00
499869	B670	88306-4	02/10/2015	09/10/2015			212	09/10/2015	$1,216.00
498996	B680	84059-14	02/10/2015	07/10/2015	08/31/2015	-63			$1,216.00
498998	B680	84059-13	02/10/2015	07/10/2015	08/31/2015	-63			$1,216.00
499454	B680	264-1113	02/10/2015	07/10/2015			107	05/28/2015	$4,863.00
499335	B682	91482PA1	02/12/2015	05/12/2015			15	02/27/2015	$579.00

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
499417	B720	89850-8	02/12/2015	07/13/2015			146	07/08/2015	$1,217.00
499416	B720	89850-7	02/12/2015	07/13/2015			146	07/08/2015	$1,217.00
499415	B720	73479-15	02/16/2015	07/16/2015			143	07/09/2015	$1,217.00
499779	B680	79766-5	03/02/2015	08/03/2015			151	07/31/2015	$4,863.00
499775	B680	79766-1	03/02/2015	08/03/2015			151	07/31/2015	$4,863.00
500445	B680	86174-3	03/04/2015	08/04/2015			90	06/02/2015	$1,216.00
500138	B680	86174-4	03/04/2015	08/04/2015			90	06/02/2015	$1,216.00
500325	B670	82437-10	03/17/2015	10/19/2015			202	10/05/2015	$1,216.00
500392	B680	62097-29	03/19/2015	08/19/2015			141	08/07/2015	$4,863.00
500395	B720	89850-9	03/19/2015	08/19/2015			141	08/07/2015	$1,217.00
500394	B720	89850-16	03/19/2015	08/19/2015			141	08/07/2015	$1,217.00
502393	B682	73748PA1	03/25/2015	06/25/2015			79	06/12/2015	$2,316.00
502469	B672	70310-I	04/01/2015	05/02/2016		182			$2,171.00
502467	B672	70310-T	04/02/2015	05/02/2016		182			$2,171.00
502429	B673	70310-A	04/02/2015	02/02/2016		92			$1,216.00
502455	B682	524PA9	04/07/2015	07/07/2015			90	07/06/2015	$2,316.00
502448	B660	73049-506	04/08/2015	08/10/2015			119	08/05/2015	$1,217.00
503048	B660	67690-76	04/22/2015	08/24/2015			113	08/13/2015	$753.00
503170	B880	524-AEL	04/23/2015	01/25/2016		84			$30,390.00
503170	B880	524-AEL	04/23/2015	01/25/2016		84			$30,390.00
503173	B880	524-AEA	04/23/2015	01/25/2016		84			$30,390.00
503369	B680	264-1159	05/04/2015	10/05/2015			149	09/30/2015	$4,863.00
503405	B670	42519-GT	05/06/2015	12/07/2015		35			$4,863.00
503623	B600	87472-R	05/11/2015	06/13/2016		224			$4,559.00
503589	B614.2	91201PA1	05/11/2015	08/11/2015			73	07/23/2015	$4,818.00

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
503585	B720	73479-16	05/11/2015	10/13/2015			134	09/22/2015	$1,217.00
503985	B660	75499-RI	05/20/2015	09/21/2015			28	06/17/2015	$1,217.00
503996	B672	91664-R	05/21/2015	06/21/2016		232			$8,683.00
503997	B672	91664-E	05/21/2015	06/21/2016		232			$8,683.00
504131	B630	69969-U	05/22/2015	06/22/2016		233			$3,039.00
504131	B630	69969-U	05/22/2015	06/22/2016		233			$3,039.00
504133	B630.0		05/22/2015	06/22/2016		233			$0.00
504133	B630.0		05/22/2015	06/22/2016		233			$0.00
504929	B885	62719-AOU	05/22/2015	02/22/2016		112			$30,390.00
503908	B670	8281-I	05/25/2015	12/28/2015			51	07/15/2015	$4,863.00
504923	B590	87978-G	05/27/2015	10/27/2016		360			$7,598.00
504925	B590.0	87978-U	05/27/2015	10/27/2016		360			$0.00
504926	B590.0		05/27/2015	10/27/2016		360			$0.00
504895	B681	73314-2	05/27/2015	12/28/2015		56			$9,726.00
504896	B682	89668PA1	05/27/2015	08/27/2015			85	08/20/2015	$579.00
505226	B660	90930-3	06/08/2015	10/08/2015			94	09/10/2015	$1,217.00
505528	B600	64137-RE	06/18/2015	07/18/2016		259			$4,559.00
505483	B670	88760-A	06/18/2015	01/19/2016		78			$1,216.00
505482	B680	264-1158	06/23/2015	11/23/2015			100	10/01/2015	$4,863.00
505621	B660	90930-T	06/24/2015	10/26/2015			0	06/24/2015	$1,217.00
505825	B672	10163-GGA	06/29/2015	07/29/2016		270			$8,683.00
506061	B612	70051-REN	07/07/2015	05/09/2016		189			$16,714.00
505526	B680	84059-17	07/07/2015	12/07/2015			50	08/26/2015	$1,216.00
506082	B680	68173-1	07/08/2015	12/08/2015		36			$4,863.00
506274	B680	88847-2	07/10/2015	12/10/2015		38			$1,216.00

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
506152	B660	85385-E	07/13/2015	11/13/2015			49	08/31/2015	$1,217.00
506547	B885	524-AET	07/15/2015	04/15/2016		165			$30,390.00
508671	B670	89402-R	07/23/2015	02/23/2016		113			$4,863.00
506540	B773	8917-EUP-2	07/23/2015	12/23/2015		51			$30,390.00
506542	B773.0		07/23/2015	12/23/2015		51			$0.00
506930	B772	88232-EUP-1	07/27/2015	10/27/2015			91	10/26/2015	$3,039.00
507035	B660	71038-L	08/07/2015	12/07/2015		35			$1,217.00
507198	B680	70759-1	08/11/2015	01/11/2016		70			$4,863.00
507199	B670	88760-T	08/12/2015	03/14/2016		133			$1,216.00
507315	B730	52991-28	08/17/2015	01/19/2016		78			$305.00
508417	B590.0	90866-RT	08/18/2015	01/18/2017	02/01/2017	457			$0.00
508418	B590.0	SF8387	08/18/2015	01/18/2017	02/01/2017	457			$0.00
507788	B720	80286-EG	08/27/2015	01/27/2016		86			$305.00
504903	B672	89600-G	08/31/2015	09/30/2016		333			$2,171.00
508414	B590	90866-RA	09/01/2015	02/01/2017		457			$7,596.00
507196	B672	90866-RL	09/01/2015	10/03/2016		336			$2,171.00
508314	B670	84059-ET	09/02/2015	04/04/2016		154			$2,432.00
508471	B610.0	SE9397	09/04/2015	07/05/2016	07/18/2016	259			$0.00
508319	B670	32936-R	09/04/2015	04/04/2016		154			$4,863.00
508320	B670	32936-E	09/04/2015	04/04/2016		154			$4,863.00
508321	B660	89013-R	09/07/2015	01/07/2016		66			$1,217.00
508629	B660	84846-RG	09/15/2015	01/15/2016		74			$1,217.00
508472	B851	67979-GN	09/17/2015	06/17/2016		228			$121,552.00
508469	B610	91163-EUP-R	09/18/2015	07/18/2016		259			$0.00
508883	B720	56336-AI	09/24/2015	02/24/2016		114			$1,217.00

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days To Complete	Completed Date	Fee Paid*
508885	B720	56336-AO	09/24/2015	02/24/2016		114			$1,217.00
508886	B720	73479-RT	09/24/2015	02/24/2016		114			$1,217.00
508887	B720	73479-RI	09/24/2015	02/24/2016		114			$1,217.00

* Fee payment collected is based on the PRIA category which fits the action being requested (http://www2.epa.gov/pria-fees/fy-201617-fee-schedule-registration-applications#biopesticides). The base fee can be reduced by 50% or 75% under the small business waiver provision of PRIA. Federal agencies and state governments are exempt from covered registration service fees under PRIA. A non-federal application would be exempt from registration service fees if the Agency determines that the application: 1) is solely associated with a tolerance petition submitted in connection with USDA's Interregional Research Project Number 4 (IR-4), and 2) an exemption from registration service fees is in the public interest. Aggregate PRIA fees collected for BPPD registration actions submitted in FY15 were $882,095.

Table II
Status of PRIA Actions Submitted in FY 2015
Registration Division (RD)

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
490335	R320	241-UUT	02/06/2015	02/08/2016		96			$12,597
492834	R320	100-1556	10/09/2014	10/09/2015			195	04/22/2015	$12,596
493891	R310	88957-1	01/09/2015	08/10/2015			194	07/22/2015	$5,048
494109	R190	400-467	10/06/2014	01/06/2016		63			$0
494110	R175	400-467	10/06/2014	08/05/2015	01/06/2016	63			$0
494790	R298		10/03/2014	11/03/2015		-1			$0
495032	R333	352-907	12/15/2014	10/15/2015			255	08/27/2015	$18,893
495105	R170	5481-429	10/09/2014	01/11/2016		68			$0
495154	R333	71173-E	10/01/2014	08/03/2015			306	08/03/2015	$18,893
495155	R190	100-1259	10/03/2014	01/04/2016		61			$0
495157	R175	100-1259	10/03/2014	08/03/2015	01/04/2016	61			$0
495212	R190	74054-1	10/03/2014	01/04/2016		61			$0
495214	R333	81964-6	10/01/2014	08/03/2015			253	06/11/2015	$18,893
495216	R333	81964-5	10/01/2014	08/03/2015			303	07/31/2015	$18,893
495218	R300	87373-RR	10/01/2014	02/02/2015			9	10/10/2014	$1,506
495219	R300	87373-RE	10/01/2014	02/02/2015			9	10/10/2014	$1,506
495233	R170.2	71711-26	11/03/2014	02/03/2016			317	09/16/2015	$0
495235	R175	71711-26	11/03/2014	09/03/2015	02/03/2016		317	09/16/2015	$0
495310	R351	89117-1	10/03/2014	06/03/2015			195	04/16/2015	$12,596
495311	R350	10163-251	10/02/2014	07/02/2015			271	06/30/2015	$12,596
495312	R340	59807-5	10/03/2014	02/03/2015			125	02/05/2015	$3,798
495313	R340	59807-6	10/03/2014	02/03/2015			126	02/06/2015	$3,798
495314	R310	7792-7	10/16/2014	05/18/2015			186	04/20/2015	$1,262
495316	R300	91145-3	10/14/2014	02/17/2015			119	02/10/2015	$377
495318	R300	91145-1	10/14/2014	02/17/2015			119	02/10/2015	$377
495320	R300	91145-2	10/14/2014	02/17/2015			111	02/02/2015	$377
495325	R230	264-1049	10/03/2014	01/04/2016		61			$25,168
495326	R230.1	432-RLUE	10/03/2014	01/04/2016		61			$6,292
495362	R272	8033PA3	10/08/2014	01/08/2015			57	12/04/2014	$2,409
495363	R272	8033PA4	10/08/2014	01/08/2015			57	12/04/2014	$2,409
495409	R300	89167-47	10/06/2014	02/06/2015			120	02/03/2015	$1,506
495411	R314	11220-UG	10/07/2014	05/08/2015			111	01/26/2015	$6,310
495416	R300	524-621	10/06/2014	02/06/2015			123	02/06/2015	$1,506
495417	R300	524-622	10/06/2014	02/06/2015			123	02/06/2015	$1,506
495418	R260	8033-RGR	10/09/2014	10/09/2015	01/07/2016	64			$12,156
495448	R300	83520-32	10/08/2014	02/09/2015			116	02/03/2015	$1,506
495449	R300	83520-33	10/08/2014	02/09/2015	05/09/2015		211	05/07/2015	$1,506
495450	R310	7969-GAO	10/08/2014	05/08/2015			212	05/08/2015	$5,048
495452	R340	5481-9028	10/09/2014	02/09/2015			116	02/02/2015	$3,798
495479	R310	71368-113	10/07/2014	05/07/2015			212	05/07/2015	$5,048

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
495485	R310.1	71368-114	10/07/2014	05/07/2015			212	05/07/2015	$1,506
495501	R301	79894-U	10/30/2014	03/02/2015			-22	10/08/2014	$452
495506	R301	33658-36	10/09/2014	02/09/2015			123	02/09/2015	$1,806
495523	R340	62719-8	10/10/2014	02/10/2015			62	12/11/2014	$3,798
495524	R351	35935-101	10/10/2014	06/10/2015			207	05/05/2015	$12,596
495560	R310	239-2725	10/16/2014	05/18/2015			194	04/28/2015	$5,048
495571	R310	53883-355	10/13/2014	05/13/2015			199	04/30/2015	$5,048
495608	R301	42750-EIT	10/17/2014	02/17/2015			-4	10/13/2014	$1,806
495610	R314	100-1559	10/14/2014	06/15/2015			170	04/02/2015	$6,310
495612	R351	11685-15	10/14/2014	06/15/2015			177	04/09/2015	$12,596
495613	R351	35935-59	10/14/2014	06/15/2015			217	05/19/2015	$12,596
495614	R350	100-1349	10/14/2014	07/14/2015			213	05/15/2015	$12,596
495615	R170	10163-277	10/14/2014	01/14/2016		71			$62,975
495616	R170.0		10/14/2014	01/14/2016		71			$0
495682	R314	66330-424	10/16/2014	06/16/2015			201	05/05/2015	$6,310
495683	R300	91234-1	10/16/2014	02/17/2015			116	02/09/2015	$1,506
495726	R351	87093-3	10/17/2014	06/17/2015			221	05/26/2015	$3,149
495735	R340	62719-533	10/20/2014	02/20/2015			113	02/10/2015	$3,798
495737	R170	100-1120	11/03/2014	02/03/2016		91			$0
495739	R175	100-1120	11/03/2014	09/03/2015	02/03/2016	91			$0
495741	R170.0	100-1220	10/17/2014	01/19/2016	02/03/2016	91			$0
495742	R175.0	100-1220	10/17/2014	08/17/2015	02/03/2016	91			$0
495745	R170.0	100-1098	10/17/2014	01/19/2016	02/03/2016	91			$0
495746	R175.0	100-1098	10/17/2014	08/17/2015	02/03/2016	91			$0
495749	R170.0		10/16/2014	01/19/2016	02/03/2016	91			$0
495750	R175.0		10/16/2014	08/17/2015	02/03/2016	91			$0
495902	R340	67690-34	10/20/2014	02/20/2015			108	02/05/2015	$1,899
495904	R301	42750-EII	10/23/2014	02/23/2015			-10	10/13/2014	$1,806
495905	R350	352-597	10/20/2014	07/20/2015			211	05/19/2015	$12,596
495906	R301	89168-UU	10/20/2014	02/20/2015			70	12/29/2014	$1,806
495939	R300	91097-1	10/30/2014	03/02/2015			92	01/30/2015	$753
495991	R314	71368-115	10/23/2014	06/23/2015			238	06/18/2015	$6,310
496001	R250	100-EUP-RRA	10/20/2014	04/20/2015	11/20/2015	16			$18,893
496058	R314	2217-1005	10/24/2014	06/24/2015			230	06/11/2015	$6,310
496070	R340	961-423	10/27/2014	02/27/2015			120	02/24/2015	$3,798
496075	R351	19713-59	10/29/2014	06/29/2015			161	04/08/2015	$12,596
496077	R351	352-591	10/29/2014	06/29/2015			189	05/06/2015	$12,596
496093	R351	70506-234	11/05/2014	07/06/2015			159	04/13/2015	$12,596
496094	R351.1	70506-235	11/05/2014	07/06/2015			159	04/13/2015	$3,149
496096	R300	83529-42	10/27/2014	02/27/2015			116	02/20/2015	$1,506
496098	R300	91097-2	10/30/2014	03/02/2015			120	02/27/2015	$753
496101	R300	91097-3	10/30/2014	03/02/2015			120	02/27/2015	$753
496103	R300	91097-4	10/30/2014	03/02/2015			42	12/11/2014	$753

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
496105	R300	91097-5	10/30/2014	03/02/2015			106	02/13/2015	$753
496132	R300	10404-112	10/28/2014	03/02/2015			119	02/24/2015	$1,506
496138	R170.3	100-1418	11/20/2014	02/22/2016		110			$188,925
496146	R170.0	100-1420	10/27/2014	01/27/2016	02/22/2016	110			$0
496154	R170.0		10/27/2014	01/27/2016	02/22/2016	110			$0
496163	R190	100-618	11/03/2014	02/03/2016		91			$0
496165	R175	100-618	11/03/2014	09/03/2015	02/03/2016	91			$0
496167	R190.0	100-617	10/27/2014	01/27/2016	02/03/2016	91			$0
496168	R175.0	100-617	10/27/2014	08/27/2015	02/03/2016	91			$0
496169	R190.0	100-1178	10/27/2014	01/27/2016	02/03/2016	91			$0
496170	R175.0	100-1178	10/27/2014	08/27/2015	02/03/2016	91			$0
496171	R190.0	100-1312	10/27/2014	01/27/2016	02/03/2016	91			$0
496172	R175.0	100-1312	10/27/2014	08/27/2015	02/03/2016	91			$0
496173	R190.0	100-1324	10/27/2014	01/27/2016	02/03/2016	91			$0
496174	R175.0	100-1324	10/27/2014	08/27/2015	02/03/2016	91			$0
496175	R190.0		10/27/2014	01/27/2016	02/03/2016	91			$0
496176	R175.0		10/27/2014	08/27/2015	02/03/2016	91			$0
496211	R340	4822-597	10/29/2014	03/02/2015			106	02/12/2015	$3,798
496212	R300	89167-48	10/30/2014	03/02/2015			120	02/27/2015	$1,506
496235	R351	10163-216	10/30/2014	06/30/2015			195	05/13/2015	$12,596
496244	R340	83923-2	10/31/2014	03/02/2015			101	02/09/2015	$3,798
496245	R340	9688-285	10/31/2014	03/02/2015	06/02/2015		200	05/19/2015	$3,798
496297	R272	80224-1	10/15/2014	01/15/2015	03/15/2015		146	03/10/2015	$602
496310	R340	12455-142	10/31/2014	03/02/2015			112	02/20/2015	$3,798
496311	R340.1	12455-120	10/31/2014	03/02/2015			112	02/20/2015	$950
496312	R340	12455-121	11/10/2014	03/10/2015			105	02/23/2015	$3,798
496314	R314	71368-116	11/04/2014	07/06/2015	08/05/2015		261	07/23/2015	$6,310
496346	R351	91139-1	11/04/2014	07/06/2015			223	06/15/2015	$12,596
496355	R340	73079-6	11/04/2014	03/04/2015	04/03/2015		148	04/01/2015	$950
496356	R340	83070-1	11/04/2014	03/04/2015			112	02/24/2015	$3,798
496357	R340	85905-8	11/04/2014	03/04/2015			114	02/26/2015	$3,798
496376	R300	400-604	11/04/2014	03/04/2015			97	02/09/2015	$1,506
496382	R301	53883-GLA	11/04/2014	03/04/2015			100	02/12/2015	$1,806
496409	R310	90568-R	11/11/2014	06/11/2015			212	06/11/2015	$5,048
496416	R300	91145-4	10/20/2014	02/20/2015			113	02/10/2015	$377
496418	R300	91145-5	10/20/2014	02/20/2015			108	02/05/2015	$377
496473	R314	83070-RE	11/10/2014	07/10/2015	12/01/2015	27			$6,310
496474	R300	352-908	11/07/2014	03/09/2015			119	03/06/2015	$1,506
496476	R300	33270-33	11/07/2014	03/09/2015			111	02/26/2015	$1,506
496477	R301	33427-L	11/07/2014	03/09/2015			11	11/18/2014	$1,806
496478	R230	7969-312	11/05/2014	02/05/2016		93			$25,168
496479	R260	7969-312	11/05/2014	11/05/2015	02/05/2016	93			$12,158
496481	R230.0	7969-GTN	11/05/2014	02/05/2016		93			$0

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
496482	R260.0	7969-GTN	11/05/2014	11/05/2015	02/05/2016	93			$0
496486	R300	352-911	11/07/2014	03/09/2015	07/09/2015		216	06/11/2015	$1,506
496487	R300	432-1573	11/07/2014	03/09/2015			119	03/06/2015	$1,506
496488	R300	432-1576	11/07/2014	03/09/2015	07/09/2015		216	06/11/2015	$1,506
496512	R340	228-485	11/10/2014	03/10/2015	06/10/2015		140	03/30/2015	$3,798
496513	R340	9688-322	11/10/2014	03/10/2015			119	03/09/2015	$3,798
496514	R340	9688-321	11/10/2014	03/10/2015			119	03/09/2015	$3,798
496515	R340	9688-313	11/10/2014	03/10/2015			113	03/03/2015	$3,798
496518	R352	70506-243	11/04/2014	07/06/2015			239	07/01/2015	$12,596
496519	R310	42750-290	11/14/2014	06/15/2015			210	06/12/2015	$5,048
496520	R310	42750-289	11/14/2014	06/15/2015			210	06/12/2015	$5,048
496570	R351	38167-31	11/14/2014	07/14/2015			143	04/06/2015	$12,596
496575	R301	10404-114	11/12/2014	03/12/2015			112	03/04/2015	$1,806
496579	R272	11556PA32	11/12/2014	02/12/2015			86	02/06/2015	$2,409
496580	R301	66330-425	11/11/2014	03/11/2015			120	03/11/2015	$1,806
496581	R333	81964-7	11/12/2014	09/14/2015			278	08/17/2015	$18,893
496582	R301	10404-113	11/11/2014	03/11/2015			113	03/04/2015	$1,806
496584	R340	69526-13	11/14/2014	03/16/2015			122	03/16/2015	$3,798
496585	R340	69526-17	11/14/2014	03/16/2015			122	03/16/2015	$3,798
496638	R351	74530-11	11/17/2014	07/17/2015			162	04/28/2015	$12,596
496639	R351	59639-180	11/17/2014	07/17/2015			241	07/16/2015	$12,596
496640	R300	91145-6	11/13/2014	03/13/2015			111	03/04/2015	$377
496642	R300	91145-7	11/13/2014	03/13/2015			104	02/25/2015	$377
496677	R230	53883-GLT	11/13/2014	02/16/2016		104			$25,168
496678	R345	1021-2564	11/17/2014	06/17/2015			101	02/26/2015	$8,400
496679	R333	81598-14	11/14/2014	09/14/2015			194	05/27/2015	$18,893
496682	R340	34704-867	11/18/2014	03/18/2015			-6	11/12/2014	$3,798
496723	R170.2	59639-197	11/12/2014	02/12/2016			141	04/02/2015	$125,950
496724	R170.0	59639-152	11/12/2014	02/12/2016			141	04/02/2015	$0
496728	R310	60063-55	11/18/2014	06/18/2015			202	06/08/2015	$5,048
496762	R340	61282-63	11/24/2014	03/24/2015			100	03/04/2015	$3,798
496803	R340	89459-1	11/21/2014	03/23/2015			119	03/20/2015	$3,798
496808	R351	42750-57	11/21/2014	07/21/2015			182	05/22/2015	$12,596
496812	R301	10404-115	11/18/2014	03/18/2015			106	03/04/2015	$1,806
496903	R320	2792-TI	12/30/2014	12/30/2015		56			$12,596
496905	R300	80967-RU	11/19/2014	03/19/2015			110	03/09/2015	$1,506
496906	R301	10404-116	11/20/2014	03/20/2015			106	03/06/2015	$1,806
496907	R301	88863-2	11/21/2014	03/23/2015			117	03/18/2015	$1,806
496908	R310	239-2726	11/21/2014	06/22/2015	07/22/2015		241	07/20/2015	$5,048
496909	R333	84228-38	11/21/2014	09/21/2015			203	06/12/2015	$18,893
496910	R334	81964-I	11/21/2014	10/21/2015	03/31/2016	148			$18,893
496911	R300	70505-314	11/19/2014	03/19/2015			78	02/05/2015	$1,506
496912	R272	2596PA2	11/26/2014	03/02/2015	04/17/2015		136	04/13/2015	$2,409

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
496923	R340	4822-561	11/24/2014	03/24/2015			106	03/10/2015	$3,798
496925	R351	279-9548	11/24/2014	07/24/2015			206	06/18/2015	$12,596
496993	R351	11678-73	11/25/2014	07/27/2015			231	07/14/2015	$12,596
496994	R351	264-343	11/24/2014	07/24/2015			171	05/14/2015	$12,596
496995	R340	2724-826	11/26/2014	03/26/2015			65	01/30/2015	$3,798
496996	R340	75257-1	11/24/2014	03/24/2015	06/27/2015		213	06/25/2015	$3,798
496997	R340.1	75844-7	11/24/2014	03/24/2015	06/27/2015		213	06/25/2015	$950
496998	R310	83100-40	11/25/2014	06/25/2015			119	03/24/2015	$5,048
496999	R340.1	75844-8	11/24/2014	03/24/2015	06/27/2015		213	06/25/2015	$950
497002	R170	100-791	11/24/2014	02/24/2016		112			$62,975
497003	R170.0	100-799	11/24/2014	02/24/2016		112			$0
497004	R301	53883-358	11/27/2014	03/27/2015	06/19/2015		134	04/10/2015	$1,806
497005	R170.0		11/24/2014	02/24/2016		112			$0
497059	R334	80967-RL	11/26/2014	10/26/2015			42	01/07/2015	$18,893
497060	R272	2724PA11	11/28/2014	03/02/2015			89	02/25/2015	$2,409
497061	R350	62719-657	11/26/2014	08/26/2015			265	08/18/2015	$12,596
497062	R340	9688-136	11/26/2014	03/26/2015			111	03/17/2015	$3,798
497063	R351	74530-11	11/28/2014	07/28/2015			165	05/12/2015	$12,596
497129	R351	82542-3	11/27/2014	07/27/2015			207	06/22/2015	$12,596
497131	R340	228-528	11/26/2014	03/26/2015			63	01/28/2015	$3,798
497163	R351	84229-40	11/28/2014	07/28/2015			221	07/07/2015	$12,596
497164	R310	7969-371	11/28/2014	06/29/2015			193	06/09/2015	$5,048
497165	R310	12455-RUU	11/28/2014	06/29/2015			102	03/10/2015	$5,048
497166	R310	42750-291	12/03/2014	07/06/2015			201	06/22/2015	$5,048
497167	R300	80289-21	11/28/2014	03/30/2015			61	01/28/2015	$1,506
497175	R371	524-EUP-106	12/03/2014	06/03/2015	07/10/2015		219	07/10/2015	$9,609
497189	R314	59639-204	11/28/2014	07/28/2015			137	04/14/2015	$6,310
497190	R314	59639-205	12/01/2014	08/03/2015			134	04/14/2015	$6,310
497191	R310	55146-152	12/03/2014	07/06/2015			168	05/20/2015	$5,048
497245	R190	100-1001	12/31/2014	03/31/2016	08/31/2017	666			$0
497252	R190.0	100-1070	12/01/2014	03/01/2016	08/31/2017	666			$0
497255	R190.0		12/01/2014	03/01/2016	08/31/2017	666			$0
497260	R292		12/01/2014	11/02/2015	01/04/2016	61			$43,181
497285	R340	352-445	12/03/2014	04/03/2015			56	01/28/2015	$3,798
497286	R351	35935-22	12/03/2014	08/03/2015			184	06/05/2015	$12,596
497291	R340	1021-2609	12/01/2014	04/01/2015			120	03/31/2015	$3,798
497294	R340	70506-254	12/03/2014	04/03/2015			99	03/12/2015	$3,798
497299	R310	42750-292	12/05/2014	07/06/2015			188	06/11/2015	$5,048
497302	R300	89442-22	12/03/2014	04/03/2015			113	03/26/2015	$1,506
497304	R333	81598-15	12/03/2014	10/05/2015			222	07/13/2015	$18,893
497313	R300	89167-49	12/01/2014	04/01/2015			115	03/26/2015	$1,506
497314	R301	84836-19	12/01/2014	04/01/2015			120	03/31/2015	$1,806
497340	R292		12/05/2014	11/05/2015	03/23/2016	140			$43,181

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
497341	R292.0	100-1254	12/05/2014	11/05/2015	03/23/2016	140			$0
497343	R190	62719-499	12/12/2014	03/14/2016		131			$0
497345	R175	62719-499	12/12/2014	10/13/2015	03/14/2016	131			$0
497350	R190.0	62719-611	12/05/2014	03/07/2016	03/14/2016	131			$0
497351	R175.0	62719-611	12/05/2014	10/05/2015	03/14/2016	131			$0
497353	R190.0		12/05/2014	03/07/2016	03/14/2016	131			$0
497354	R175.0		12/05/2014	10/05/2015	03/14/2016	131			$0
497398	R060	91266-1	12/08/2014	09/08/2016			92	03/10/2015	$0
497406	R340	2217-455	12/08/2014	04/08/2015			108	03/26/2015	$3,798
497407	R340	2724-822	12/10/2014	04/10/2015			51	01/30/2015	$3,798
497408	R272	2596PA4	12/16/2014	03/16/2015			87	03/13/2015	$2,409
497433	R351	81598-12	12/09/2014	08/10/2015			195	06/22/2015	$12,596
497435	R340	239-2718	12/09/2014	04/09/2015			113	04/01/2015	$3,798
497436	R340	1021-2573	12/08/2014	04/08/2015	06/10/2015		157	05/14/2015	$3,798
497437	R340	239-2717	12/09/2014	04/09/2015			98	03/17/2015	$3,798
497438	R350	352-883	12/09/2014	09/09/2015			268	09/03/2015	$12,596
497439	R315	83399-15	12/05/2014	09/08/2015			277	09/08/2015	$8,400
497475	R371	524-EUP-106	12/11/2014	06/11/2015			-21	11/20/2014	$4,807
497481	R314	7969-372	12/10/2014	08/10/2015			230	07/28/2015	$6,310
497482	R310	228-731	12/10/2014	07/10/2015			182	06/10/2015	$5,048
497484	R300	69361-48	12/10/2014	04/10/2015			113	04/02/2015	$452
497509	R350	62719-416	12/08/2014	09/08/2015			88	03/06/2015	$12,596
497612	R340	89459-40	12/17/2014	04/17/2015			93	03/20/2015	$3,798
497613	R314	1021-2790	12/12/2014	08/12/2015			224	07/24/2015	$6,310
497614	R314.2	1021-ETOR	12/16/2014	08/17/2015	12/17/2015	43			$5,048
497615	R320	228-TGE	07/20/2015	07/20/2016		259			$12,596
497616	R300	74468-13	12/16/2014	04/16/2015			-1	12/15/2014	$1,506
497641	R351	89275-1	12/15/2014	08/17/2015			148	05/12/2015	$12,596
497645	R314	352-912	12/15/2014	08/17/2015			245	08/17/2015	$6,310
497646	R351	264-1077	12/16/2014	08/17/2015			189	06/23/2015	$12,596
497647	R351	81598-1	12/16/2014	08/17/2015			174	06/08/2015	$12,596
497648	R310	83100-41	12/16/2014	07/16/2015			134	04/29/2015	$5,048
497649	R301	33270-GU	12/16/2014	04/16/2015			34	01/19/2015	$1,806
497650	R314	2217-1006	11/27/2014	07/27/2015			242	07/27/2015	$6,310
497651	R251	72500-EUP-3	12/15/2014	08/17/2015			239	08/11/2015	$4,724
497654	R314.1	2217-1007	11/27/2014	07/27/2015			242	07/27/2015	$1,678
497656	R175	100-936	12/15/2014	10/15/2015			108	04/02/2015	$62,975
497658	R175.0	100-941	12/15/2014	10/15/2015			108	04/02/2015	$0
497660	R175.0		12/15/2014	10/15/2015			108	04/02/2015	$0
497702	R340	1021-1834	12/19/2014	04/20/2015			75	03/04/2015	$3,798
497703	R340	4822-529	12/19/2014	04/20/2015			111	04/09/2015	$3,798
497704	R300	89442-24	12/19/2014	04/20/2015			55	02/12/2015	$1,506
497706	R301	91090-R	12/17/2014	04/17/2015			82	03/09/2015	$1,806

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
497707	R300	91097-6	12/17/2014	04/17/2015			118	04/14/2015	$753
497709	R300	83520-34	12/17/2014	04/17/2015			111	04/07/2015	$1,506
497710	R300	89442-23	12/17/2014	04/17/2015			57	02/12/2015	$1,506
497714	R334	264-RRIR	12/17/2014	11/17/2015		13			$37,786
497768	R340	67702-14	12/23/2014	04/23/2015			21	01/13/2015	$3,798
497834	R170	100-1254	12/23/2014	03/23/2016		140			$62,975
497835	R170.0		12/05/2014	03/07/2016	03/23/2016	140			$0
497839	R340	73079-14	12/24/2014	04/24/2015	05/25/2015		148	05/21/2015	$950
497841	R350	66330-252	12/23/2014	09/23/2015			147	05/19/2015	$12,596
497885	R300	91097-7	12/24/2014	04/24/2015			110	04/13/2015	$753
497888	R300	91097-8	12/24/2014	04/24/2015			90	03/24/2015	$753
497890	R300	91097-9	12/24/2014	04/24/2015			113	04/16/2015	$753
497893	R300	91097-10	12/24/2014	04/24/2015			113	04/16/2015	$753
497898	R300	52287-21	12/24/2014	04/24/2015			119	04/22/2015	$1,506
497913	R340	228-484	12/25/2014	04/27/2015			103	04/07/2015	$3,798
497914	R300	83520-35	12/25/2014	04/27/2015			105	04/09/2015	$1,506
497935	R250	66330-EUP-4	12/24/2014	06/24/2015	07/14/2015		198	07/10/2015	$4,724
497939	R170.2	100-811	01/12/2015	04/12/2016		160			$125,950
497941	R170.0	100-1317	12/24/2014	03/24/2016	04/12/2016	160			$0
497942	R170.0		12/24/2014	03/24/2016	04/12/2016	160			$0
497955	R351	84229-30	12/26/2014	08/26/2015			137	05/12/2015	$12,596
497956	R230	432-RLUG	12/25/2014	03/25/2016		142			$25,168
497960	R190	59639-2	02/02/2015	05/02/2016		180			$0
497962	R175	59639-2	02/02/2015	12/02/2015	05/02/2016	180			$0
497964	R190.0	59639-3	12/25/2014	03/25/2016	05/02/2016	180			$0
497965	R175.0	59639-3	12/25/2014	10/26/2015	05/02/2016	180			$0
497966	R190.0	59639-83	12/25/2014	03/25/2016	05/02/2016	180			$0
497967	R175.0	59639-83	12/25/2014	10/26/2015	05/02/2016	180			$0
497968	R190.0	59639-132	12/25/2014	03/25/2016	05/02/2016	180			$0
497969	R175.0	59639-132	12/25/2014	10/26/2015	05/02/2016	180			$0
497970	R190.0	59639-148	12/25/2014	03/25/2016	05/02/2016	180			$0
497971	R175.0	59639-148	12/25/2014	10/26/2015	05/02/2016	180			$0
497978	R190.0		12/25/2014	03/25/2016	05/02/2016	180			$0
497980	R175.0		12/25/2014	10/26/2015	05/02/2016	180			$0
498013	R340	279-9548	11/24/2014	03/24/2015	07/24/2015		206	06/18/2015	$3,798
498038	R340	67702-45	12/23/2014	04/23/2015			98	03/31/2015	$3,798
498043	R340	87655-3	01/05/2015	05/06/2015			50	02/25/2015	$3,798
498060	R351	42750-230	12/30/2014	08/31/2015			231	08/18/2015	$12,596
498129	R300	228-733	12/30/2014	04/30/2015			97	04/06/2015	$1,506
498130	R331	59639-206	12/29/2014	03/30/2015			7	01/05/2015	$2,409
498131	R331	59639-207	12/29/2014	03/30/2015			67	03/06/2015	$2,409
498133	R333	85678-31	12/31/2014	11/02/2015			243	08/31/2015	$18,893
498134	R334	7969-GTG	01/01/2015	12/01/2015		27			$18,893

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
498135	R340	53883-315	01/01/2015	05/01/2015			105	04/16/2015	$3,798
498155	R315	91090-E	12/29/2014	09/29/2015			70	03/09/2015	$2,100
498207	R310	19713-664	02/10/2015	09/10/2015	09/24/2015		226	09/24/2015	$5,048
498209	R310	19713-665	02/10/2015	09/10/2015	09/24/2015		226	09/24/2015	$5,048
498219	R170	10163-6415	12/31/2014	03/31/2016		148			$0
498223	R170.0	10163-6414	12/30/2014	03/30/2016	03/31/2016	148			$0
498225	R170.0		12/30/2014	03/30/2016	03/31/2016	148			$0
498277	R314	2217-1008	01/05/2015	09/08/2015			214	08/07/2015	$6,310
498280	R310	86458-2	01/05/2015	08/05/2015			212	08/05/2015	$1,262
498305	R333	85678-GE	01/06/2015	11/06/2015		2			$18,893
498345	R351	100-1198	01/02/2015	09/02/2015			195	07/16/2015	$12,596
498346	R301	53883-360	01/02/2015	05/04/2015	07/27/2015		203	07/24/2015	$1,806
498347	R301	53883-359	01/02/2015	05/04/2015	07/27/2015		203	07/24/2015	$1,806
498348	R310	7969-374	01/07/2015	08/07/2015			208	08/03/2015	$5,048
498406	R340	71368-25	01/07/2015	05/07/2015			85	04/02/2015	$3,798
498407	R310	228-734	01/06/2015	08/06/2015			219	08/13/2015	$5,048
498448	R351	100-579	01/09/2015	09/09/2015			138	05/27/2015	$12,596
498449	R300	89167-51	01/08/2015	05/08/2015			-1	01/07/2015	$1,506
498450	R300	83100-42	01/09/2015	05/11/2015			108	04/27/2015	$1,806
498451	R300	89167-50	01/08/2015	05/08/2015			103	04/21/2015	$1,506
498459	R170.2	62719-631	01/21/2015	04/21/2016		169			$125,950
498460	R230	62719-631	01/08/2015	04/08/2016	04/21/2016	169			$25,188
498461	R170.0	62719-625	01/08/2015	04/08/2016	04/21/2016	169			$0
498463	R230.0	62719-625	01/08/2015	04/08/2016	04/21/2016	169			$0
498464	R170.0	62719-623	01/08/2015	04/08/2016	04/21/2016	169			$0
498465	R230.0	62719-623	01/08/2015	04/08/2016	04/21/2016	169			$0
498472	R170.0		01/08/2015	04/08/2016	04/21/2016	169			$0
498485	R190	279-3181	01/15/2015	04/15/2016		163			$0
498487	R175	279-3181	01/15/2015	11/16/2015	04/15/2016	163			$0
498489	R190.0	279-3194	01/02/2015	04/04/2016	04/15/2016	163			$0
498490	R175.0	279-3194	01/02/2015	11/02/2015	04/15/2016	163			$0
498491	R190.0	279-3242	01/02/2015	04/04/2016	04/15/2016	163			$0
498492	R175.0	279-3242	01/02/2015	11/02/2015	04/15/2016	163			$0
498496	R190.0	279-3276	01/02/2015	04/04/2016	04/15/2016	163			$0
498499	R175.0	279-3276	01/02/2015	11/02/2015	04/15/2016	163			$0
498503	R190.0	279-3241	01/02/2015	04/04/2016	04/15/2016	163			$0
498505	R175.0	279-3241	01/02/2015	11/02/2015	04/15/2016	163			$0
498511	R190.0		12/29/2014	03/29/2016	05/02/2016	189			$0
498512	R175.0		12/29/2014	10/29/2015	05/02/2016	180			$0
498515	R314	5481-585	01/12/2015	09/14/2015			228	08/28/2015	$6,310
498516	R333	82633-23	01/12/2015	11/12/2015			246	09/15/2015	$18,893
498517	R301	33270-35	01/12/2015	05/12/2015			107	04/29/2015	$1,806
498527	R334	73605-A	01/12/2015	12/14/2015		40			$4,723

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
498529	R334	73605-T	01/12/2015	12/14/2015		40			$4,723
498531	R334	73605-I	01/12/2015	12/14/2015			46	02/27/2015	$4,723
498621	R340	39039-21	01/20/2015	05/20/2015			84	04/14/2015	$1,899
498623	R320	89118-U	01/14/2015	01/14/2016		71			$3,149
498625	R310	74578-10	01/19/2015	08/19/2015			212	08/19/2015	$5,048
498626	R272	72642PA1	01/14/2015	04/14/2015			70	03/25/2015	$2,409
498627	R334	66330-UEA	01/09/2015	12/09/2015		35			$18,893
498628	R320	89118-3	01/14/2015	01/14/2016			121	05/15/2015	$3,149
498630	R300	72155-112	01/12/2015	05/12/2015			99	04/21/2015	$1,506
498631	R300	72155-113	01/12/2015	05/12/2015			99	04/21/2015	$1,506
498633	R300	10404-117	01/12/2015	05/12/2015			105	04/27/2015	$1,506
498672	R351	100-914	01/14/2015	09/14/2015			180	07/13/2015	$12,596
498673	R351	59639-177	01/14/2015	09/14/2015			183	07/16/2015	$12,596
498674	R340	2724-806	01/21/2015	05/21/2015			112	05/13/2015	$3,798
498675	R310	39039-22	01/14/2015	08/14/2015			188	07/21/2015	$2,524
498677	R320	89118-L	01/20/2015	01/20/2016		77			$3,149
498681	R333	91459-1	01/19/2015	11/19/2015			226	09/02/2015	$18,893
498683	R301	83100-UG	01/13/2015	05/13/2015			29	02/11/2015	$1,806
498685	R315	2517-RTG	03/10/2015	12/10/2015		36			$8,400
498686	R315	2517-RTL	03/10/2015	12/10/2015		36			$8,400
498687	R020	524-AEG	01/08/2015	07/08/2016		247			$597,683
498688	R020.0	524-AEU	01/08/2015	07/08/2016		247			$0
498689	R020.0		01/08/2015	07/08/2016		247			$0
498748	R300	3282-RRG	01/26/2015	05/26/2015			57	03/24/2015	$1,506
498831	R351	70506-41	03/20/2015	11/20/2015			174	09/10/2015	$12,596
498874	R340	61282-46	02/02/2015	06/02/2015			30	03/04/2015	$3,798
498887	R314	264-RRIE	04/09/2015	12/09/2015		35			$6,310
498900	R315	2517-RTA	03/10/2015	12/10/2015		36			$8,400
498903	R315	2517-RTU	03/10/2015	12/10/2015		36			$8,400
498943	R020	10163-GGG	02/02/2015	08/02/2016		272			$597,683
498944	R020.0	10163-GGU	01/27/2015	07/27/2016	08/02/2016	272			$0
498945	R020.0		01/27/2015	07/27/2016	08/02/2016	272			$0
498948	R190	7969-312	01/30/2015	05/02/2016		180			$377,849
498949	R190.0	7969-306	01/30/2015	05/02/2016		180			$0
498950	R190.0	7969-311	01/30/2015	05/02/2016		180			$0
498951	R190.0	7969-309	01/30/2015	05/02/2016		180			$0
498952	R190.0		01/30/2015	05/02/2016		180			$0
498956	R340	5481-554	01/30/2015	06/01/2015			33	03/04/2015	$3,798
498972	R340	7969-274	01/30/2015	06/01/2015			74	04/14/2015	$3,798
498973	R340	279-3347	01/30/2015	06/01/2015			122	06/01/2015	$3,798
499059	R351	81598-2	02/02/2015	10/02/2015			176	07/28/2015	$12,596
499060	R351	19713-601	02/04/2015	10/05/2015			181	08/04/2015	$12,596
499061	R300	81927-55	01/30/2015	06/01/2015			83	04/23/2015	$1,506

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
499062	R300	11220-44	02/03/2015	06/03/2015			91	05/05/2015	$1,506
499063	R310	88058-U	02/03/2015	09/03/2015			31	03/06/2015	$5,048
499128	R310	239-2727	02/04/2015	09/04/2015			184	08/07/2015	$5,048
499138	R340	81927-45	02/04/2015	06/04/2015			92	05/07/2015	$3,798
499139	R310	100-1560	02/02/2015	09/02/2015			207	08/28/2015	$5,048
499152	R300	63191-17	02/02/2015	05/02/2015			45	03/19/2015	$377
499158	R351	81598-5	02/05/2015	10/05/2015			196	08/20/2015	$12,596
499160	R300	39039-24	02/05/2015	06/05/2015			120	06/05/2015	$753
499163	R300	39039-23	02/05/2015	06/05/2015			35	03/12/2015	$753
499165	R310	100-1561	02/04/2015	09/04/2015			182	08/05/2015	$5,048
499196	R340	62719-581	02/10/2015	06/10/2015			64	04/15/2015	$3,798
499197	R340.1	62719-568	02/03/2015	06/03/2015	06/10/2015		71	04/15/2015	$950
499198	R340.1	62719-569	02/03/2015	06/03/2015	06/10/2015		71	04/15/2015	$950
499199	R340.1	62719-582	02/03/2015	06/03/2015	06/10/2015		71	04/15/2015	$950
499201	R340.1	62719-643	02/03/2015	06/03/2015	06/10/2015		71	04/15/2015	$950
499235	R300	538-327	02/06/2015	06/08/2015			98	05/15/2015	$1,506
499265	R340	12455-136	02/10/2015	06/10/2015			27	03/09/2015	$3,798
499266	R340	42750-207	02/13/2015	06/15/2015			102	05/26/2015	$3,798
499328	R340	64321-11	02/20/2015	06/22/2015			119	06/19/2015	$3,798
499329	R340.1	64321-10	02/20/2015	06/22/2015			119	06/19/2015	$950
499330	R351	81598-12	02/12/2015	10/13/2015			188	08/19/2015	$12,596
499337	R334	80967-RA	02/13/2015	01/13/2016		70			$18,893
499381	R340	1021-2781	02/11/2015	06/11/2015	10/08/2015		229	09/28/2015	$3,798
499382	R340	2724-497	02/17/2015	06/17/2015			114	06/11/2015	$3,798
499386	R300	239-2728	02/13/2015	06/15/2015	07/30/2015		160	07/23/2015	$1,506
499387	R300	33270-GA	02/13/2015	06/15/2015			-4	02/09/2015	$1,506
499388	R310	74843-A	02/13/2015	09/14/2015			194	08/26/2015	$5,048
499431	R310	90354-R	02/12/2015	09/14/2015			137	06/29/2015	$1,262
499488	R350	264-1167	02/17/2015	11/17/2015		13			$12,596
499489	R301	70804-1	02/18/2015	06/18/2015			120	06/18/2015	$1,806
499490	R300	34704-1092	02/17/2015	06/17/2015			99	05/27/2015	$1,506
499548	R350	4822-605	05/29/2015	02/29/2016		117			$12,596
499556	R310	89333-U	04/17/2015	11/17/2015		13			$5,048
499578	R351	352-399	01/29/2015	09/29/2015			162	07/10/2015	$12,596
499582	R301	83919-R	02/19/2015	06/19/2015			32	03/23/2015	$1,262
499596	R292.0	10163-277	02/18/2015	01/19/2016		76			$0
499597	R292		02/18/2015	01/19/2016		76			$43,181
499598	R340	100-1489	02/19/2015	06/19/2015	09/19/2015		188	08/26/2015	$3,798
499599	R340.1	100-1503	02/19/2015	06/19/2015	09/19/2015		188	08/26/2015	$950
499631	R351	85678-8	02/23/2015	10/23/2015			171	08/13/2015	$12,596
499632	R300	85678-GG	02/23/2015	06/23/2015			-4	02/19/2015	$1,506
499633	R124	42750PA1	02/25/2015	08/25/2015			163	08/07/2015	$2,409
499696	R340	538-313	02/24/2015	06/24/2015			112	06/16/2015	$3,798

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
499697	R340	87655-3	02/24/2015	06/24/2015			37	04/02/2015	$3,798
499699	R310	5905-596	02/24/2015	09/24/2015			188	08/31/2015	$5,048
499704	R310	2217-1010	02/24/2015	09/24/2015			210	09/22/2015	$5,048
499705	R310.1	2217-1009	02/24/2015	09/24/2015			210	09/22/2015	$1,506
499784	R301	3-RL	02/26/2015	06/26/2015			41	04/08/2015	$1,806
499853	R350	100-1530	02/23/2015	11/23/2015			217	09/28/2015	$12,596
499866	R301	89459-80	03/02/2015	07/02/2015			122	07/02/2015	$1,806
499886	R350	352-729	03/02/2015	12/02/2015		28			$12,596
499890	R351	400-467	03/02/2015	11/02/2015			199	09/17/2015	$12,596
499913	R320	100-RLAE	03/02/2015	03/02/2016		119			$12,596
499914	R340	352-528	03/03/2015	07/06/2015			64	05/06/2015	$3,798
499915	R310	89459-81	03/02/2015	10/02/2015			203	09/21/2015	$5,048
499922	R300	90780-1	03/03/2015	07/06/2015			114	06/25/2015	$1,506
499957	R170.5	71512-8	02/26/2015	05/26/2016		204			$0
499959	R170.0	71512-1	02/27/2015	05/27/2016		205			$0
499960	R170.0		02/27/2015	05/27/2016		205			$0
499975	R350	42750-19	03/06/2015	12/07/2015		33			$12,596
500011	R300	8329-103	03/04/2015	07/06/2015			111	06/23/2015	$753
500015	R300	72155-114	03/04/2015	07/06/2015	08/05/2015		135	07/17/2015	$1,506
500019	R300	8329-104	03/04/2015	07/06/2015			42	04/15/2015	$753
500022	R350	8033-36	03/06/2015	12/07/2015		33			$12,596
500023	R340	12455-89	03/02/2015	07/02/2015			71	05/12/2015	$3,798
500025	R340	12455-79	03/02/2015	07/02/2015			71	05/12/2015	$3,798
500027	R351	2749-93	03/05/2015	11/05/2015			159	08/11/2015	$12,596
500033	R272	74720PA1	03/05/2015	06/05/2015			76	05/20/2015	$2,409
500034	R301	90234-4	03/12/2015	07/13/2015			111	07/01/2015	$452
500036	R301	90234-3	03/10/2015	07/10/2015			113	07/01/2015	$452
500038	R301	90234-2	03/10/2015	07/10/2015			113	07/01/2015	$452
500040	R301	90234-1	03/10/2015	07/10/2015			113	07/01/2015	$452
500042	R314	100-RLAG	03/03/2015	11/03/2015			50	04/22/2015	$6,310
500044	R350	8033-23	03/06/2015	12/07/2015		33			$12,596
500092	R300	89442-25	03/06/2015	07/06/2015			109	06/23/2015	$1,506
500095	R124	85972PA2	03/06/2015	09/08/2015			45	04/20/2015	$2,409
500217	R340	81927-23	03/11/2015	07/13/2015			64	05/14/2015	$3,798
500222	R340	1381-98	03/17/2015	07/17/2015			35	04/21/2015	$3,798
500223	R351	88685-3	03/11/2015	11/12/2015			135	07/24/2015	$12,596
500224	R340	1381-102	03/16/2015	07/16/2015			98	06/22/2015	$3,798
500226	R301	19713-686	03/13/2015	07/13/2015			109	06/30/2015	$1,806
500227	R300	90780-2	03/11/2015	07/13/2015			119	07/08/2015	$1,506
500228	R300	90780-4	03/11/2015	07/13/2015			118	07/07/2015	$1,506
500245	R124	4787PA10	03/13/2015	09/14/2015			97	06/18/2015	$2,409
500247	R124	67760PA5	03/11/2015	09/11/2015			161	08/19/2015	$2,409
500319	R340	12455-133	04/06/2015	08/06/2015			36	05/12/2015	$1,899

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
500322	R300	1381-257	03/18/2015	07/20/2015			97	06/23/2015	$1,506
500356	R320	5481-LIA	03/18/2015	03/18/2016		135			$12,596
500357	R314	100-RLAU	03/13/2015	11/13/2015	01/20/2016	77			$6,310
500368	R301	19713-668	03/19/2015	07/20/2015			104	07/01/2015	$1,806
500383	R310	7969-375	03/19/2015	10/19/2015			145	08/11/2015	$5,048
500384	R300	90780-9	03/19/2015	07/20/2015			119	07/16/2015	$1,506
500385	R300	90780-8	03/19/2015	07/20/2015			120	07/17/2015	$1,506
500386	R300	90780-6	03/19/2015	07/20/2015			119	07/16/2015	$1,506
500387	R300	90780-5	03/18/2015	07/20/2015			112	07/08/2015	$1,506
500388	R300	90780-7	03/19/2015	07/20/2015			110	07/07/2015	$1,506
500439	R300	90780-11	03/20/2015	07/20/2015			118	07/16/2015	$1,506
500441	R300	90780-10	03/20/2015	07/20/2015			119	07/17/2015	$1,506
500442	R333	70506-GRL	03/20/2015	01/20/2016		77			$18,893
500443	R333	35484-T	03/19/2015	01/19/2016		76			$18,893
500453	R300	62719-691	03/24/2015	07/24/2015			66	05/29/2015	$1,600
500695	R273	264-1137	03/17/2015	03/17/2016		134			$48,042
500696	R273.0	264-1169	03/17/2015	03/17/2016		134			$0
500697	R170	59639-97	03/05/2015	06/06/2016		215			$62,975
500733	R170.0	59639-99	03/05/2015	06/06/2016		215			$0
500734	R170.0	59639-119	03/05/2015	06/06/2016		215			$0
500735	R170.0	59639-127	03/05/2015	06/06/2016		215			$0
500736	R170.0		03/05/2015	06/06/2016		215			$0
500737	R314	2217-RNRE	03/12/2015	11/12/2015		8			$6,310
500738	R314.1	2217-RNRR	03/12/2015	11/12/2015		8			$1,578
500741	R170.2	71512-2	03/17/2015	06/17/2016		226			$125,950
500742	R170.0	71512-3	03/17/2015	06/17/2016		226			$0
500743	R170.0		03/17/2015	06/17/2016		226			$0
500744	R180	71512-2	04/08/2015	02/08/2016		96			$0
500746	R180.0	71512-3	03/05/2015	01/05/2016	02/08/2016	96			$0
500747	R180.0		03/05/2015	01/05/2016	02/08/2016	96			$0
500748	R351	90188-1	03/23/2015	11/23/2015			126	07/27/2015	$12,596
500751	R300	85678-34	03/25/2015	07/27/2015			113	07/16/2015	$1,506
501246	R370	51147-9	03/13/2015	09/13/2015			90	06/11/2015	$70,804
501366	R351	81598-6	03/30/2015	11/30/2015		26			$12,596
501380	R300	89167-52	03/25/2015	07/27/2015			112	07/15/2015	$1,506
501381	R300	352-914	03/24/2015	07/24/2015			121	07/23/2015	$1,506
501382	R300	352-913	03/24/2015	07/24/2015			121	07/23/2015	$1,506
501383	R320	5481-LIT	03/25/2015	03/25/2016		142			$12,596
501385	R333	82633-EU	03/30/2015	02/01/2016		89			$18,893
501386	R320	279-GUTU	03/30/2015	03/30/2016		147			$12,596
501387	R301	84009-3	03/27/2015	07/27/2015			105	07/10/2015	$1,806
501787	R190	11678-73	03/06/2015	06/06/2016		215			$379,355
501788	R190.0	66222-243	03/06/2015	06/06/2016		215			$0

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
501789	R190.0	66222-EAE	03/06/2015	06/06/2016		215			$0
501790	R320	66222-EAE	03/06/2015	03/07/2016	06/06/2016	215			$12,596
501793	R190.0		03/06/2015	06/06/2016		215			$0
501831	R340	21165-34	03/11/2015	07/13/2015			92	06/11/2015	$3,798
501834	R273	264-824	03/24/2015	03/24/2016		141			$48,042
501844	R351	87812-1	03/31/2015	11/30/2015		26			$12,596
501846	R350	62719-631	03/16/2015	12/16/2015	04/21/2016	169			$12,596
501847	R350.1	62719-623	04/03/2015	01/04/2016	04/21/2016	169			$3,149
501849	R292		03/18/2015	02/18/2016	04/21/2016	169			$43,181
501852	R273.0	264-825	03/24/2015	03/24/2016		141			$0
502230	R301	33270-GI	04/02/2015	08/03/2015			112	07/23/2015	$1,806
502284	R351	400-585	03/31/2015	11/30/2015		26			$12,596
502287	R351	62097-15	03/27/2015	11/27/2015		23			$12,596
502317	R301	53883-GAR	04/03/2015	08/03/2015			31	05/04/2015	$1,806
502323	R170	8033-111	04/03/2015	07/05/2016		244			$62,975
502384	R350	7969-297	04/10/2015	01/11/2016		68			$12,596
502388	R310	279-GUTA	04/06/2015	11/06/2015			28	05/04/2015	$1,262
502391	R310	279-GUTL	04/06/2015	11/06/2015			28	05/04/2015	$1,262
502425	R310	9688-GGR	04/07/2015	11/09/2015			169	09/23/2015	$5,048
502427	R334	91127-E	04/07/2015	03/07/2016		124			$18,893
502465	R310	400-ANL	04/08/2015	11/09/2015		5			$5,048
502466	R272	89459PA1	04/09/2015	07/09/2015			75	06/23/2015	$2,409
502475	R320	100-RLAL	04/07/2015	04/07/2016		155			$12,596
502505	R350	71085-34	04/10/2015	01/11/2016			118	08/06/2015	$12,596
502506	R301	91232-R	04/09/2015	08/10/2015			19	04/28/2015	$1,806
502521	R340	64864-68	06/16/2015	10/16/2015			49	08/04/2015	$3,798
502522	R272	9688PA1	04/10/2015	07/10/2015			68	06/17/2015	$2,409
502606	R170	10163-283	04/08/2015	07/08/2016		247			$62,975
502608	R170.0		04/08/2015	07/08/2016		247			$0
502611	R272	2596-178	04/20/2015	07/20/2015			71	06/30/2015	$2,409
502613	R340	69117-2	04/13/2015	08/13/2015			112	08/03/2015	$950
502652	R298		04/15/2015	05/16/2016		194			$55,776
502653	R298.0	10163-277	04/09/2015	05/09/2016	05/16/2016	194			$0
502659	R350	12455-136	04/14/2015	01/14/2016		71			$12,596
502660	R340	71376-3	04/14/2015	08/14/2015			106	07/29/2015	$3,798
502661	R351	1015-76	04/16/2015	12/16/2015			131	08/25/2015	$3,149
502665	R340	4-429	04/14/2015	08/14/2015			98	07/21/2015	$1,899
502668	R351	1015-74	04/16/2015	12/16/2015			139	09/02/2015	$3,149
502670	R301	42750-294	04/16/2015	08/17/2015			119	08/13/2015	$1,806
502675	R320	279-GUTT	05/06/2015	05/06/2016		184			$12,596
502734	R301	82074-7	04/14/2015	08/14/2015			107	07/30/2015	$452
502736	R301	82074-6	04/14/2015	08/14/2015			107	07/30/2015	$452
502744	R350	8033-116	04/16/2015	01/19/2016		78			$12,596

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
502745	R333	4787-AA	04/14/2015	02/16/2016			98	07/21/2015	$18,893
502747	R310	3282-RRU	04/20/2015	11/20/2015		16			$5,048
502754	R351	66330-332	04/16/2015	12/16/2015			116	08/10/2015	$12,596
502795	R333	82633-EL	04/16/2015	02/16/2016		104			$18,893
502796	R310	87290-LO	04/15/2015	11/16/2015		12			$5,048
502797	R314	71085-UN	04/17/2015	12/17/2015		43			$6,310
502798	R060	56228-AN	04/16/2015	01/17/2017			105	07/30/2015	$0
502802	R301	19713-AAO	04/13/2015	08/13/2015			-14	03/30/2015	$1,806
502836	R310	12455-145	04/10/2015	11/10/2015			26	05/06/2015	$5,048
502854	R292.0	10163-250	03/04/2015	02/04/2016		92			$0
502880	R320	100-RLAA	04/13/2015	04/13/2016		161			$12,596
502883	R351	100-739	04/21/2015	12/21/2015		47			$12,596
502893	R301	89442-26	04/21/2015	08/21/2015			120	08/19/2015	$1,806
502895	R170	67690-TU	04/21/2015	07/21/2016		260			$31,488
502897	R170	67690-TL	04/21/2015	07/21/2016		260			$31,488
502934	R340	279-3105	04/21/2015	08/21/2015			28	05/19/2015	$3,798
502936	R300	432-1545	04/22/2015	08/24/2015			69	06/30/2015	$1,506
502974	R352	86794-1	06/26/2015	02/26/2016		114			$12,596
502977	R352.1	86794-3	04/20/2015	12/21/2015	02/26/2016	114			$3,149
502978	R352.1	86794-2	04/20/2015	12/21/2015	02/26/2016	114			$3,149
502982	R340	279-3596	04/22/2015	08/24/2015			124	08/24/2015	$3,798
502983	R340	100-1436	04/22/2015	08/24/2015	11/24/2015	20			$3,798
502984	R340.1	100-1437	04/22/2015	08/24/2015	11/24/2015	20			$950
502985	R310	11556-RIA	04/23/2015	11/23/2015		19			$5,048
502988	R300	42750-295	04/24/2015	08/24/2015			122	08/24/2015	$1,506
502992	R314	279-GUTI	04/23/2015	12/23/2015		49			$6,310
502993	R310	70506-GRA	04/23/2015	11/23/2015		19			$5,048
503063	R350	100-640	04/22/2015	01/22/2016		79			$12,596
503068	R340	4822-472	04/24/2015	08/24/2015			110	08/12/2015	$3,798
503147	R350	352-832	04/28/2015	01/28/2016		85			$12,596
503208	R300	83529-UG	04/29/2015	08/31/2015			5	05/04/2015	$1,506
503225	R340	66222-251	05/28/2015	09/28/2015			120	09/25/2015	$3,798
503273	R350	100-953	04/30/2015	02/01/2016		89			$12,596
503276	R350	100-1317	04/30/2015	02/01/2016		89			$12,596
503332	R351	400-97	05/04/2015	01/04/2016		61			$12,596
503339	R170	100-811	04/24/2015	07/25/2016		264			$62,975
503341	R170.0	100-1317	04/24/2015	07/25/2016		264			$0
503342	R170.0	100-828	04/21/2015	07/21/2016	07/25/2016	264			$0
503343	R170.0	100-953	04/24/2015	07/25/2016		264			$0
503344	R170.0		04/24/2015	07/25/2016		264			$0
503388	R310	83529-UU	05/04/2015	12/04/2015		30			$5,048
503389	R300	33270-39	05/05/2015	09/08/2015			112	08/25/2015	$1,506
503437	R272	11556PA34	05/06/2015	08/06/2015			64	07/09/2015	$2,409

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
503461	R010	71512-EI	05/05/2015	05/05/2017		548			$597,683
503462	R010.0	71512-EO	05/05/2015	05/05/2017		548			$0
503463	R010.0		05/05/2015	05/05/2017		548			$0
503493	R314	55146-RLG	05/07/2015	01/07/2016		64			$6,310
503494	R314	55146-RLU	05/07/2015	01/07/2016		64			$6,310
503495	R314	62719-AOG	05/07/2015	01/07/2016		64			$6,310
503496	R300	91234-2	05/06/2015	09/08/2015			77	07/22/2015	$1,506
503497	R300	91234-3	05/06/2015	09/08/2015			83	07/28/2015	$1,506
503498	R300	91234-4	05/06/2015	09/08/2015			83	07/28/2015	$1,506
503517	R351X2	264-343	06/11/2015	02/11/2016		99			$25,192
503521	R340	83070-4	05/08/2015	09/08/2015			97	08/13/2015	$3,798
503524	R301	91300-1	05/08/2015	09/08/2015			111	08/27/2015	$1,806
503525	R314	83070-RG	05/08/2015	01/08/2016		65			$6,310
503526	R310	83070-RU	05/08/2015	12/08/2015		34			$5,048
503575	R272.4	1021PA5	07/20/2015	10/20/2015			52	09/10/2015	$9,636
503576	R340	65331-8	05/11/2015	09/11/2015			87	08/06/2015	$3,798
503578	R351	71185-4	06/02/2015	02/02/2016		90			$3,149
503581	R300	83923-13	05/11/2015	09/11/2015			114	09/02/2015	$1,506
503583	R315	83399-RA	05/08/2015	02/08/2016		96			$8,400
503584	R315	83399-RT	05/08/2015	02/08/2016		96			$8,400
503627	R310	83529-UA	05/11/2015	12/11/2015		37			$5,048
503658	R315	91090-G	06/29/2015	03/29/2016		146			$2,100
503725	R260	11556-RIT	05/14/2015	05/16/2016		194			$12,156
503745	R301	67505-12	05/13/2015	09/14/2015			106	08/27/2015	$1,806
503746	R301	89609-2	06/17/2015	10/19/2015			76	09/01/2015	$1,806
503749	R301	1543-3	06/17/2015	10/19/2015			76	09/01/2015	$1,806
503792	R333	81964-O	05/18/2015	03/18/2016		135			$18,893
503797	R300	69117-12	05/18/2015	09/18/2015			122	09/17/2015	$377
503800	R300	42750-296	05/20/2015	09/21/2015			54	07/13/2015	$1,506
503801	R351	71185-5	06/02/2015	02/02/2016		90			$3,149
503824	R314	87845-A	05/12/2015	01/12/2016		69			$1,578
503827	R310	19713-ATN	05/19/2015	12/21/2015		47			$5,048
503896	R350	53883-348	05/21/2015	02/22/2016		110			$12,596
503944	R350	69526-13	06/01/2015	03/01/2016		118			$12,596
503945	R350	69526-17	06/01/2015	03/01/2016		118			$12,596
504005	R340	1381-249	05/29/2015	09/29/2015			112	09/18/2015	$3,798
504006	R300	9688-332	05/26/2015	09/28/2015			59	07/24/2015	$1,506
504007	R310	85787-R	05/25/2015	12/28/2015		54			$5,048
504086	R333	42750-EOT	06/01/2015	04/01/2016		149			$18,893
504870	R351	11603-42	05/29/2015	01/29/2016		86			$12,596
504871	R300	498-203	05/29/2015	09/29/2015			109	09/15/2015	$377
504887	R272	1021PA6	06/01/2015	09/01/2015			74	08/14/2015	$2,409
504919	R350	352-885	05/28/2015	02/29/2016		117			$12,596

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
504920	R350.1	352-886	06/03/2015	03/03/2016		120			$3,149
504921	R350.1	352-887	06/03/2015	03/03/2016		120			$3,149
504938	R351	73342-8	06/01/2015	02/01/2016		89			$12,596
504939	R290		05/28/2015	08/29/2016		299			$60,777
504940	R300	8033-RGG	06/03/2015	10/05/2015	12/07/2015	33			$1,506
504941	R300	8033-RGE	06/03/2015	10/05/2015	12/07/2015	33			$1,506
504943	R310	89168-UL	06/04/2015	01/04/2016		61			$5,048
504999	R333	82542-GU	06/03/2015	04/04/2016		152			$18,893
505001	R292		06/03/2015	05/03/2016		181			$43,181
505002	R272	432PA4	06/03/2015	09/03/2015			49	07/22/2015	$2,409
505003	R301	279-GUTO	06/09/2015	10/09/2015			65	08/13/2015	$1,806
505023	R170.4	33906-20	06/10/2015	09/12/2016		313			$0
505025	R175	33906-20	[redacted]	04/11/2016	09/12/2016	313			$0
505027	R170.0	81880-5	06/02/2015	09/02/2016	09/12/2016	313			$0
505028	R175.0	81880-5	06/02/2015	04/04/2016	09/12/2016	313			$0
505029	R170.0	81880-4	06/02/2015	09/02/2016	09/12/2016	313			$0
505030	R175.0	81880-4	06/02/2015	04/04/2016	09/12/2016	313			$0
505031	R170.0		[redacted]	09/02/2016	09/12/2016	313			$0
505032	R175.0		06/02/2015	04/04/2016	09/12/2016	313			$0
505040	R340	67895-1	06/04/2015	10/05/2015			28	06/30/2015	$3,798
505042	R310	538-GEI	06/04/2015	01/04/2016		61			$5,048
505043	R314	42750-EOI	06/05/2015	02/05/2016		93			$6,310
505067	R340	11556-185	06/05/2015	10/05/2015	11/16/2015	12			$3,798
505068	R292		06/04/2015	05/04/2016			106	09/18/2015	$55,776
505103	R301	10163-GGL	06/08/2015	10/08/2015			24	07/02/2015	$452
505154	R334	66330-UET	06/05/2015	05/05/2016		183			$18,893
505193	R351	66330-65	06/09/2015	02/09/2016		97			$12,596
505194	R351	89117-1	07/03/2015	03/03/2016		120			$12,596
505195	R333	89966-G	06/09/2015	04/11/2016		159			$18,893
505196	R334	64864-TE	06/16/2015	05/16/2016		194			$18,893
505241	R333	2217-RNRG	06/11/2015	04/11/2016		159			$18,893
505242	R310	7173-GNU	06/11/2015	01/11/2016		68			$5,048
505243	R290.4		06/16/2015	09/16/2016		317			$243,108
505331	R333	87931-RG	06/12/2015	04/12/2016		160			$18,893
505332	R334	70506-GRT	06/12/2015	05/12/2016		190			$18,893
505338	R314	100-RLAI	06/08/2015	02/08/2016		96			$6,310
505359	R310	33427-A	06/16/2015	01/19/2016		75			$5,048
505360	R301	87290-60	06/16/2015	10/16/2015			98	09/22/2015	$1,806
505383	R170	33906-10	06/16/2015	09/16/2016		317			$62,975
505386	R170.0	33906-9	06/12/2015	09/12/2016	09/16/2016	317			$0
505388	R170.0		06/12/2015	09/12/2016	09/16/2016	317			$0
505414	R320	62719-AOL	06/17/2015	06/17/2016		226			$12,596
505456	R300	91234-5	06/18/2015	10/19/2015			76	09/02/2015	$1,506

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
505487	R310	239-ETEO	06/18/2015	01/19/2016		76			$5,048
505488	R315	91384-R	06/17/2015	03/17/2016		134			$8,400
505489	R315	91384-E	06/17/2015	03/17/2016		134			$8,400
505506	R351	42750-276	06/19/2015	02/19/2016		107			$12,596
505513	R314	264-RRIU	06/19/2015	02/19/2016		107			$6,310
505543	R300	83529-47	06/22/2015	10/22/2015			94	09/24/2015	$1,806
505548	R301	75844-O	06/19/2015	10/19/2015			55	08/13/2015	$1,806
505591	R351	264-653	06/23/2015	02/23/2016		111			$12,596
505593	R272.2	91605PA1	06/23/2015	09/23/2015			90	09/21/2015	$1,206
505620	R350	279-3557	06/23/2015	03/23/2016		140			$12,596
505691	R351	81598-8	06/26/2015	02/26/2016		114			$12,596
505692	R310	239-ETGN	06/26/2015	01/26/2016		83			$5,048
505730	R310	70506-GRI	06/30/2015	02/01/2016		89			$5,048
505795	R350	62719-677	06/29/2015	03/29/2016		146			$12,596
505847	R351	11503-44	07/01/2015	03/01/2016		118			$12,596
505938	R292.2		07/15/2015	06/15/2016		224			$86,362
506019	R273	59639-185	06/24/2015	06/24/2016		233			$48,042
506020	R273.0	59639-186	06/24/2015	06/24/2016		233			$0
506054	R331	100-1569	07/07/2015	10/07/2015			41	08/17/2015	$2,409
506086	R301	19713-ATR	07/10/2015	11/10/2015		6			$1,806
506095	R292.3		07/08/2015	06/08/2016		217			$0
506097	R292.0	352-728	07/08/2015	06/08/2016		217			$0
506098	R175	352-728	07/08/2015	05/09/2016	06/08/2016	217			$0
506100	R175.0		07/08/2015	05/09/2016	06/08/2016	217			$0
506102	R292.0	352-729	07/08/2015	06/08/2016		217			$0
506104	R175.0	352-729	07/08/2015	05/09/2016	06/08/2016	217			$0
506105	R292.0	352-730	07/08/2015	06/08/2016		217			$0
506106	R175.0	352-730	07/08/2015	05/09/2016	06/08/2016	217			$0
506133	R351	89707-1	07/10/2015	03/10/2016		127			$12,596
506134	R352	81824-1	07/10/2015	03/10/2016		127			$12,596
506135	R340	81824-1	07/10/2015	11/10/2015	03/10/2016	127			$3,798
506163	R333	70506-GRO	07/13/2015	05/13/2016		191			$18,893
506164	R310	5905-LOT	07/13/2015	02/16/2016		104			$5,048
506227	R301	42750-299	07/16/2015	11/16/2015			71	09/25/2015	$1,806
506229	R301	42750-300	07/16/2015	11/16/2015			71	09/25/2015	$1,806
506230	R301	42750-GNR	07/16/2015	11/16/2015		12			$1,806
506232	R320	7969-GTT	07/15/2015	07/15/2016		254			$12,596
506233	R272	8033PA7	07/16/2015	10/16/2015			46	08/31/2015	$2,409
506235	R272	8033PA8	07/16/2015	10/16/2015			46	08/31/2015	$2,409
506325	R350	62719-375	07/16/2015	04/18/2016		166			$12,596
506329	R334	88783-L	07/16/2015	06/16/2016		225			$18,893
506398	R351	84009-1	07/20/2015	03/21/2016		138			$6,298
506401	R310	400-ANA	07/20/2015	02/22/2016		110			$5,048

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
506460	R272	100PA43	07/21/2015	10/21/2015			41	08/31/2015	$2,409
506494	R340	10163-6414	07/21/2015	11/23/2015		19			$3,798
506495	R340	10163-331	07/23/2015	11/23/2015		19			$912
506517	R310	89459-IE	07/23/2015	02/23/2016		111			$5,048
506518	R301	91300-E	07/22/2015	11/23/2015	12/23/2015	49			$1,806
506519	R301	91300-G	07/22/2015	11/23/2015	12/23/2015	49			$1,806
506521	R300	10404-RRI	07/23/2015	11/23/2015		19			$1,506
506523	R340	80697-4	07/23/2015	11/23/2015		19			$3,798
506525	R351	42750-244	07/24/2015	03/24/2016		141			$12,596
506543	R351	100-909	07/23/2015	03/23/2016		140			$12,596
506544	R351.1	100-1173	07/28/2015	03/28/2016		145			$3,149
506575	R340	499-507	07/15/2015	11/16/2015		12			$3,798
506577	R300	5905-LOI	07/30/2015	11/30/2015		26			$1,506
506633	R230	7173-GNL	07/27/2015	10/27/2016		358			$25,168
506634	R300	89442-ET	07/28/2015	11/30/2015		26			$1,506
506635	R314	89459-IG	07/30/2015	03/30/2016		147			$6,310
506636	R301	2724-IUE	07/27/2015	11/27/2015		23			$1,806
506637	R300	10404-RRO	07/28/2015	11/30/2015		26			$1,506
506644	R310	83100-UU	07/30/2015	02/29/2016		117			$5,048
506645	R170.2	100-RLTN	07/31/2015	10/31/2016		362			$125,950
506646	R170.0		07/23/2015	10/24/2016	10/31/2016	362			$0
506653	R170.2	100-963	06/29/2015	09/29/2016		330			$125,950
506656	R170.0	100-889	06/29/2015	09/29/2016		330			$0
506661	R170.0		06/29/2015	09/29/2016		330			$0
506674	R272	86661PA1	07/29/2015	10/29/2015			57	09/24/2015	$2,409
506676	R334	70506-GEN	07/29/2015	06/29/2016		238			$18,893
506727	R334	91640-R	08/04/2015	07/05/2016		244			$18,893
506729	R340	38167-35	07/29/2015	11/30/2015		26			$3,798
506730	R290		07/29/2015	10/31/2016		362			$60,777
506732	R290.0	264-1049	07/29/2015	10/31/2016		362			$0
506819	R170.5	6836-107	08/10/2015	11/10/2016		372			$0
506821	R170.0	6836-350	07/30/2015	10/31/2016	11/10/2016	372			$0
506822	R170.0		07/30/2015	10/31/2016	11/10/2016	372			$0
506823	R301	5481-LII	07/31/2015	11/30/2015		26			$1,806
506850	R300	5481-LIO	08/03/2015	12/03/2015		29			$1,506
506852	R301	19713-ATE	08/04/2015	12/04/2015		30			$1,806
506880	R351	62719-109	08/05/2015	04/05/2016		153			$12,596
506889	R314	1021-ETOA	08/03/2015	04/04/2016		152			$6,310
506897	R310	87093-L	07/31/2015	02/29/2016		117			$1,262
506906	R301	87093-A	07/31/2015	11/30/2015		26			$452
506908	R294		08/03/2015	08/03/2016		273			$305,613
506909	R300	71910-L	06/29/2015	10/29/2015			16	07/15/2015	$376
506933	R333	42750-GNE	08/06/2015	06/06/2016		215			$18,893

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
507105	R351	35935-100	08/06/2015	04/06/2016		154			$12,596
507106	R300	91300-U	08/10/2015	12/10/2015		36			$1,506
507146	R150	59639-185	08/06/2015	05/08/2017		551			$251,669
507149	R150.0	59639-ERR	08/06/2015	05/08/2017		551			$0
507151	R370	62719-21	08/11/2015	02/13/2017		467			$188,809
507152	R150.0		08/06/2015	05/08/2017		551			$0
507153	R314	89168-UA	08/10/2015	04/11/2016		159			$6,310
507154	R340	89333-2	08/13/2015	12/14/2015			32	09/14/2015	$3,798
507155	R350	83822-1	08/10/2015	05/10/2016		188			$3,149
507157	R340	89333-3	08/13/2015	12/14/2015			32	09/14/2015	$3,798
507159	R170.2	264-1118	08/10/2015	11/10/2016		372			$0
507161	R170.0	264-1119	08/10/2015	11/10/2016		372			$0
507162	R300	91234-A	08/10/2015	12/10/2015		36			$1,506
507163	R170.0		08/10/2015	11/10/2016		372			$0
507164	R300	91234-T	08/10/2015	12/10/2015		36			$1,506
507165	R300	91234-I	08/10/2015	12/10/2015		36			$1,506
507166	R300	91234-O	08/10/2015	12/10/2015		36			$1,506
507209	R351	66330-403	08/12/2015	04/12/2016		160			$12,596
507212	R340	81927-13	08/12/2015	12/14/2015		40			$3,798
507258	R350	352-906	08/17/2015	05/17/2016		195			$12,596
507262	R351	62719-539	08/13/2015	04/13/2016		161			$12,596
507331	R351	100-1133	08/18/2015	04/18/2016		166			$12,596
507395	R351	85806-4	08/19/2015	04/19/2016		167			$12,596
507396	R320	87895-U	08/19/2015	08/19/2016		289			$12,596
507476	R314	89168-UT	08/21/2015	[illegible]		169			$6,310
507597	R340	67702-14	08/24/2015	12/24/2015		50			$3,798
507598	R334	11603-LG	08/24/2015	07/25/2016		264			$18,893
507600	R300	42750-GNG	08/27/2015	12/28/2015		54			$1,506
507612	R333	7969-GTI	09/02/2015	07/05/2016		244			$18,893
507655	R350	100-1253	08/25/2015	05/25/2016		203			$12,596
507656	R300	10404-REN	08/25/2015	12/28/2015		54			$1,506
507657	R334	90736-E	08/25/2015	07/25/2016		264			$18,893
507714	R333	432-RLTU	08/28/2015	06/28/2016		237			$18,893
507718	R350.1	100-1075	08/27/2015	08/27/2016		205			$3,149
507719	R340	65331-4	08/10/2015	12/10/2015		36			$3,857
507720	R340	61282-63	08/26/2015	12/28/2015		54			$3,798
507722	R340.1	65331-5	08/10/2015	12/10/2015		36			$950
507723	R310	1381-ELI	08/31/2015	03/31/2016		148			$5,048
507725	R300	91234-RN	08/26/2015	12/28/2015		54			$1,506
507757	R314	1021-ETOU	07/13/2015	03/14/2016		131			$6,310
507758	R314.2	1021-ETOL	08/18/2015	04/18/2016		166			$5,048
507759	R350	85203-4	08/21/2015	05/23/2016	08/22/2016	292			$12,596
507760	R320	82392-G	08/21/2015	08/22/2016		292			$12,596

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
507761	R320.2	86203-ET	08/21/2015	08/22/2016		292			$5,048
507763	R170	11678-73	08/13/2015	11/14/2016		376			$0
507765	R170.0	66222-EAE	08/14/2015	11/14/2016		376			$0
507767	R170.0		08/14/2015	11/14/2016		376			$0
507768	R170.2	100-1017	09/04/2015	12/05/2016		397			$0
507772	R170.0	100-1103	08/19/2015	11/21/2016	12/05/2016	397			$0
507774	R170.0	100-993	08/19/2015	11/21/2016	12/05/2016	397			$0
507776	R170.0		08/19/2015	11/21/2016	12/05/2016	397			$0
507778	R170	61842-21	08/17/2015	11/17/2016		379			$62,975
507779	R170.0		08/17/2015	11/17/2016		379			$0
507781	R314	2517-RTT	08/27/2015	04/27/2016		175			$6,310
507786	R300	87093-I	08/27/2015	12/28/2015		54			$377
507796	R170	264-1118	08/05/2015	11/07/2016		369			$62,975
507806	R170.0	264-1119	08/05/2015	11/07/2016		369			$0
507809	R170.0	264-1122	08/12/2015	11/14/2016		376			$0
507810	R170.0		08/05/2015	11/07/2016		369			$0
507842	R170	264-776	08/05/2015	11/07/2016		369			$62,975
507843	R170.0	264-1093	08/05/2015	11/07/2016		369			$0
507844	R292		08/05/2015	07/05/2016	11/07/2016	369			$43,181
507845	R170.0		08/05/2015	11/07/2016		369			$0
507872	R170	264-824	08/05/2015	11/07/2016		369			$62,975
507873	R170.0	264-825	08/05/2015	11/07/2016		369			$0
507875	R298		08/05/2015	09/06/2016	11/07/2016	369			$55,775
507876	R170.0		08/05/2015	11/07/2016		369			$0
507878	R170.0	264-1093	08/05/2015	11/07/2016		369			$0
507879	R298.0	264-825	08/05/2015	09/06/2016	11/07/2016	369			$0
507880	R298.0	264-1122	08/12/2015	09/12/2016	11/07/2016	369			$0
507881	R350	264-825	08/05/2015	05/05/2016	11/07/2016	369			$12,596
507959	R351	62719-223	08/28/2015	04/28/2016		176			$12,596
507960	R340	100-1492	08/28/2015	12/26/2015		54			$3,798
507961	R351	19713-641	08/28/2015	04/28/2016		176			$12,596
507967	R301	35935-RNI	08/28/2015	12/28/2015		54			$1,806
507968	R300	91234-RR	08/28/2015	12/26/2015		54			$1,506
507970	R310	2935-LLO	09/01/2015	04/01/2016		149			$5,048
507971	R314	53883-GIR	09/01/2015	05/02/2016		180			$6,310
507972	R310	71368-RRT	09/01/2015	04/01/2016		149			$5,048
507973	R333	74530-AE	08/31/2015	06/30/2016		239			$18,893
507974	R300	87290-AR	09/01/2015	01/04/2016		61			$1,506
507976	R301	5481-LOG	07/31/2015	11/30/2015		26			$1,806
508010	R310	5481-LON	09/01/2015	04/01/2016		149			$12,596
508011	R310	5481-LOR	09/01/2015	04/01/2016		149			$12,596
508012	R301	5481-LOE	09/01/2015	01/04/2016		61			$1,806
508030	R333	33658-GT	09/03/2015	07/05/2016		244			$18,893

Decision Number	PRIA Code	Reg. Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
508031	R310	74530-AG	09/03/2015	04/04/2016		152			$5,048
508032	R310	74530-AU	09/03/2015	04/04/2016			1	09/04/2015	$1,262
508037	R340	34704-871	09/02/2015	01/04/2016		61			$3,798
508040	R351	8033-20	09/03/2015	03/03/2016		181			$12,596
508042	R350	74779-7	09/03/2015	06/03/2016		212			$6,298
508295	R124	88050PA1	09/09/2015	03/09/2016		126			$602
508305	R110X2	91601-R	09/10/2015	05/10/2017		553			$115,474
508307	R333	74530-AL	09/10/2015	07/11/2016		250			$18,893
508309	R180	59639-107	09/21/2015	07/21/2016		260			$62,975
508310	R180.0	59639-202	09/08/2015	07/08/2016	07/21/2016	260			$0
508312	R180.0		09/08/2015	07/08/2016	07/21/2016	260			$0
508366	R340	91019-1	09/04/2015	01/04/2016		61			$3,798
508367	R340	91019-2	09/04/2015	01/04/2016		61			$3,798
508369	R301	74779-RA	09/10/2015	01/11/2016		68			$1,806
508370	R310	67702-LR	09/04/2015	04/04/2016		152			$5,048
508371	R301	89168-UI	09/07/2015	01/07/2016		64			$1,806
508374	R350	264-1173	09/14/2015	06/14/2016		223			$12,596
508375	R272.2	1021PA9	09/14/2015	12/14/2015		40			$4,818
508376	R124	91746PA1	09/14/2015	03/14/2016		131			$2,409
508377	R300	352-ORT	09/11/2015	01/11/2016		68			$1,506
508384	R334	33658-GI	09/11/2015	08/11/2016		281			$18,893
508385	R300	85678-GL	09/11/2015	01/11/2016		68			$1,506
508388	R310	80990-A	09/18/2015	04/18/2016		166			$1,262
508390	R300	19713-ATG	09/11/2015	01/11/2016		68			$1,506
508392	R301	89168-UO	09/08/2015	01/08/2016		65			$1,806
508429	R340	61282-26	09/18/2015	01/19/2016		76			$3,798
508431	R190	59639-97	09/18/2015	12/19/2016		411			$0
508433	R175	59639-97	09/18/2015	07/18/2016	12/19/2016	411			$0
508435	R190.0	59639-207	09/11/2015	12/12/2016	12/19/2016	411			$0
508436	R175.0	59639-207	09/11/2015	07/11/2016	12/19/2016	411			$0
508437	R190.0	59639-127	09/11/2015	12/12/2016	12/19/2016	411			$0
508438	R175.0	59639-127	09/11/2015	07/11/2016	12/19/2016	411			$0
508439	R190.0	59639-119	09/11/2015	12/12/2016	12/19/2016	411			$0
508440	R175.0	59639-119	09/11/2015	07/11/2016	12/19/2016	411			$0
508441	R190.0	59639-99	09/11/2015	12/12/2016	12/19/2016	411			$0
508442	R175.0	59639-99	09/11/2015	07/11/2016	12/19/2016	411			$0
508443	R190.0		09/11/2015	12/12/2016	12/19/2016	411			$0
508444	R175.0		09/11/2015	07/11/2016	12/19/2016	411			$0
508450	R190	80289-1	09/16/2015	12/16/2016		408			$377,849
508451	R190.0	80289-7	09/16/2015	12/16/2016		408			$0
508452	R190.0	80289-8	09/16/2015	12/16/2016		408			$0
508453	R190.0	80289-18	09/16/2015	12/16/2016		408			$0
508454	R190.1	80289-EE	09/16/2015	12/16/2016		408			$6,310

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Days Remaining	Days to Complete	Completed Date	Fee Paid*
508455	R190.0		09/16/2015	12/16/2016		408			$0
508456	R310	9688-GGG	09/16/2015	04/18/2016		166			$5,048
508461	R300	19713-ATU	09/17/2015	01/19/2016		76			$1,806
508484	R300	100-1572	09/17/2015	01/19/2016			-7	09/10/2015	$1,506
508488	R300	100-1571	09/17/2015	01/19/2016			-7	09/10/2015	$1,506
508489	R300	89442-EI	09/17/2015	01/19/2016		76			$1,506
508490	R290		09/17/2015	12/19/2016		411			$60,777
508503	R272	62719PA23	09/22/2015	12/22/2015		48			$2,409
508531	R351	88685-3	09/18/2015	05/18/2016		196			$12,596
508532	R340	79533-2	09/18/2015	01/19/2016		76			$3,798
508533	R333	74530-AA	09/18/2015	07/18/2016		257			$18,893
508534	R300	4-UON	09/17/2015	01/19/2016		76			$753
508536	R310	89168-LN	09/17/2015	04/18/2016		166			$5,408
508537	R300	91234-RE	09/18/2015	01/19/2016		76			$1,506
508547	R301	55206-L	09/18/2015	01/19/2016		76			$903
508550	R310	91232-E	09/18/2015	04/18/2016		166			$5,048
508551	R314	70506-GER	09/18/2015	05/18/2016		196			$6,310
508627	R350	66222-243	09/21/2015	06/21/2016		230			$12,596
508736	R351	35935-104	09/22/2015	05/23/2016		201			$12,596
508737	R351	42750-249	09/21/2015	05/23/2016		201			$12,596
508773	R333	86865-E	09/21/2015	07/21/2016		260			$4,724
508775	R333.2	86865-G	09/21/2015	07/21/2016		260			$4,724
508843	R320	53863-GIE	09/24/2015	09/26/2016		327			$12,596
508850	R170.0	279-3052	09/24/2015	12/27/2016	02/02/2017	456			$0
508851	R170.0	279-3158	09/24/2015	12/27/2016	02/02/2017	456			$0
508852	R170.0		09/24/2015	12/27/2016	02/02/2017	456			$0
508877	R340	100-1431	09/25/2015	01/25/2016		82			$3,798
508890	R351	352-639	09/24/2015	05/24/2016		202			$12,596
508891	R301	89168-LR	09/24/2015	01/25/2016		82			$1,806
508892	R300	91411-O	09/25/2015	01/25/2016		82			$1,506
508894	R300	91411-I	09/25/2015	01/25/2016		82			$1,506
508896	R301	19713-ATA	09/29/2015	01/29/2016		86			$1,806
508902	R301	19713-ATL	09/29/2015	01/29/2016		86			$1,806
508929	R300	100-RLTG	09/29/2015	01/29/2016		86			$1,506
508941	R333.30	71173-E	09/04/2015	10/05/2015		-30			$0
508951	R334	91813-R	09/30/2015	08/31/2016		301			$18,893
508952	R300	352-ORI	09/30/2015	02/01/2016		89			$1,506
508955	R350	61842-9	09/29/2015	06/29/2016		238			$12,596
509007	R340	352-836	09/30/2015	02/01/2016		89			$3,798
509605	R298.0	10163-277	09/03/2015	10/03/2016	11/28/2016	390			$0
509715	R298.0	264-824	08/05/2015	09/06/2016	11/07/2016	369			$0
510663	R333	32240-I	09/29/2015	07/29/2016		268			$4,723

* Fee payment collected is based on the PRIA category which fits the action being requested (http://www2.epa.gov/pria-fees/fy-201617-fee-schedule-registration-applications#biopesticides). The base fee can be reduced by 50% or 75% under the small business waiver provision of PRIA. Federal agencies and state governments are exempt from covered registration service fees under PRIA. A non-federal application would be exempt from registration service fees if the Agency determines that the application: 1) is solely associated with a tolerance petition submitted in connection with USDA's Interregional Research Project Number 4 (IR-4), and 2) an exemption from registration service fees is in the public interest. Aggregate PRIA fees collected for RD registration actions submitted in FY15 were $11,200,724.

Table III
Completed Action Tracking Report
FY15 Completed Actions
Biopesticides and Pollution Prevention Division (BPPD)

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
462051	B590	38719-I	03/28/2012	07/26/2013	10/31/2014	2	946	10/30/2014
462051	B590	38719-I	03/28/2012	07/26/2013	10/31/2014	2	946	10/30/2014
470612	B590	71840-15	11/13/2012	04/14/2014	05/13/2015	2	904	05/06/2015
474676	B672	61311-U	02/28/2013	03/31/2014	10/10/2014	1	589	10/10/2014
474680	B672	61311-G	04/22/2013	05/22/2014	05/19/2015	2	681	03/04/2015
478507	B590	89600-1	05/28/2013	10/28/2014	11/11/2014	1	533	11/12/2014
478892	B590	89615-1	06/06/2013	11/06/2014	02/05/2015	2	609	02/05/2015
479256	B590	91473-1	06/18/2013	11/18/2014	02/05/2015	2	597	02/05/2015
481081	B672	87683-10	08/15/2013	09/16/2014	10/30/2015	1	705	07/22/2015
482298	B630	67727-6	09/06/2013	10/06/2014	04/30/2015	1	600	04/29/2015
483807	B672	67702-43	10/18/2013	11/18/2014			396	11/18/2014
484986	B672	88031-16	11/27/2013	12/29/2014			385	12/17/2014
483918	B672	71962-2	11/29/2013	12/29/2014	03/10/2015	1	438	02/10/2015
485121	B670	62097-33	12/11/2013	07/11/2014	12/18/2014	1	334	11/10/2014
485466	B590	89553-A	12/18/2013	05/18/2015			505	05/07/2015
485833	B672	88031-RO	12/24/2013	01/26/2015			352	12/11/2014
486921	B643	87485-1	01/29/2014	12/01/2014			306	12/01/2014
486922	B643.1	87485-3	02/12/2014	12/12/2014			292	12/01/2014
487102	B672	87357-2	02/25/2014	03/25/2015			372	03/04/2015
487892	B600	52991-GN	03/11/2014	04/13/2015			351	02/23/2015
488243	B884	524-619	03/21/2014	03/23/2015	05/18/2015	1	402	04/27/2015
488427	B672	67702-47	03/25/2014	04/27/2015			339	02/27/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
488429	B673	67702-48	03/25/2014	01/26/2015			304	01/23/2015
488448	B771	8917-EUP-2	03/25/2014	01/26/2015	02/09/2015	1	316	02/04/2015
488647	B672	43813-57	04/01/2014	05/01/2015			393	04/29/2015
487929	B590	88031-EN	04/03/2014	09/03/2015			252	12/11/2014
488828	B673	67702-49	04/08/2014	02/09/2015			304	02/05/2015
488986	B670	2724-840	04/14/2014	11/14/2014			210	11/10/2014
488987	B670.1	2724-841	04/14/2014	11/14/2014			210	11/10/2014
489815	B610.2	73049-EUP-O	04/22/2014	02/23/2015			307	02/23/2015
489428	B671	73049-500	04/25/2014	09/25/2015			518	09/25/2015
490384	B670	68173-5	05/15/2014	12/15/2014			210	12/11/2014
490704	B670	84846-10	05/20/2014	12/22/2014			203	12/09/2014
490657	B670	33270-37	05/20/2014	12/22/2014			203	12/09/2014
490701	B720	89850-6	05/20/2014	10/20/2014			136	10/03/2014
490699	B720	89850-5	05/20/2014	10/20/2014			136	10/03/2014
490839	B771	524-EUP-107	05/21/2014	03/23/2015	05/18/2015	1	341	04/27/2015
491257	B676	89459-11	05/26/2014	06/26/2015			385	06/15/2015
490984	B720	73479-14	05/27/2014	10/27/2014			150	10/24/2014
491200	B670	71065-4	05/28/2014	12/29/2014			202	12/16/2014
491200	B670	71065-4	05/28/2014	12/29/2014			202	12/16/2014
490933	B672	80286-22	05/29/2014	06/29/2015			336	04/30/2015
490743	B681	84565-2	06/17/2014	01/20/2015			189	12/23/2014
491684	B672	89820-1	06/19/2014	07/20/2015			372	06/26/2015
491621	B740	62719-EUP-66	06/19/2014	12/19/2014			182	12/18/2014
492121	B680	84059-21	06/23/2014	11/24/2014			149	11/19/2014
492106	B590	71840-RT	06/30/2014	11/30/2015			389	07/24/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
491738	B672	75747-3	07/01/2014	08/03/2015			195	01/12/2015
492038	B720	53575-44	07/01/2014	12/01/2014			143	11/21/2014
492070	B681	264-1113	07/02/2014	02/02/2015			202	01/20/2015
492314	B771	88232-EUP-1	07/08/2014	05/08/2015			296	04/30/2015
492184	B670	73049-501	07/09/2014	02/09/2015			215	02/09/2015
492433	B630	56336-67	07/11/2014	08/11/2015			390	08/05/2015
492428	B644	73049-45	07/11/2014	03/11/2015			241	03/09/2015
492429	B670	82437-8	07/11/2014	02/11/2015			185	01/12/2015
492732	B690	53575-45	07/21/2014	02/23/2015			217	02/23/2015
492991	B670	73049-502	07/23/2014	02/23/2015			202	02/10/2015
492989	B680	88847-2	07/28/2014	12/29/2014	04/27/2015	2	273	04/27/2015
493194	B670	73049-503	08/05/2014	03/05/2015			211	03/04/2015
493186	B670	89168-39	08/08/2014	03/09/2015			200	02/24/2015
493784	B590	67986-T	08/12/2014	01/12/2016			127	12/17/2014
494557	B730	56336-2	09/09/2014	02/09/2015			113	12/31/2014
495009	B681	51934-6	09/11/2014	04/13/2015	08/13/2015	1	329	08/06/2015
495007	B681	51934-2	09/11/2014	04/13/2015	08/13/2015	1	329	08/06/2015
494566	B670	88148-2	09/15/2014	04/15/2015			198	04/01/2015
494565	B670	88573-2	09/16/2014	04/16/2015			203	04/07/2015
494560	B680	88573-1	09/16/2014	02/17/2015			147	02/10/2015
494558	B680	84878-3	09/16/2014	02/17/2015			150	02/13/2015
494917	B670	84846-11	09/19/2014	04/20/2015			208	04/15/2015
494916	B681	72041-2	09/19/2014	04/20/2015			187	03/25/2015
494916	B681	72041-2	09/19/2014	04/20/2015			188	03/26/2015
494952	B880	264-1179	09/24/2014	06/24/2015			268	06/19/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
495261	B673	82074-4	09/30/2014	07/31/2015			296	07/23/2015
495278	B680	769-992	09/30/2014	03/02/2015			153	03/02/2015
495398	B680	4822-528	10/06/2014	03/06/2015			84	12/29/2014
495513	B670	84846-12	10/09/2014	05/11/2015			209	05/06/2015
495620	B681	67702-3	10/14/2014	05/14/2015			136	02/27/2015
495946	B680	70127-10	10/15/2014	03/16/2015			146	03/10/2015
495928	B683	73049-58	10/17/2014	04/17/2015			117	02/11/2015
496110	B612	89046-U	10/21/2014	08/21/2015			104	02/02/2015
496232	B670	91113-1	10/23/2014	05/26/2015			210	05/21/2015
496415	B680	88889-1	11/04/2014	04/06/2015			139	03/23/2015
496549	B772	524-EUP-104	11/04/2014	02/04/2015			92	02/04/2015
496545	B670	8218-IL	11/13/2014	06/15/2015			180	05/12/2015
496760	B885	67979-29	11/13/2014	08/13/2015			273	08/13/2015
497037	B680	88760-2	11/19/2014	04/20/2015			152	04/20/2015
497033	B680	88760-1	11/19/2014	04/20/2015			152	04/20/2015
496763	B720	90060-1	11/19/2014	04/20/2015			121	03/20/2015
497108	B673	62355-8	11/28/2014	09/28/2015			301	09/25/2015
497259	B680	87663-1	12/01/2014	05/01/2015			52	01/22/2015
497335	B680	89363-1	12/05/2014	05/05/2015			109	03/24/2015
497238	B670	87193-1	12/16/2014	07/16/2015			206	07/10/2015
497870	B682	89041PA1	12/22/2014	03/23/2015			35	01/26/2015
495250	B673	73314-RR	12/25/2014	10/26/2015			-49	11/06/2014
498435	B641		01/05/2015	02/05/2016			37	02/11/2015
498594	B680	87663-3	01/12/2015	06/12/2015			10	01/22/2015
499001	B670	264-1193	01/29/2015	08/29/2015			204	08/12/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
499133	B720	39638-45	01/29/2015	06/29/2015			91	04/30/2015
499026	B620	89285-EUP-2	01/30/2015	08/31/2015			132	06/11/2015
499025	B620	89285-EUP-1	01/30/2015	08/31/2015			132	06/11/2015
498696	B590	87645-E	02/04/2015	07/05/2016			147	07/01/2015
499869	B670	88308-4	02/10/2015	09/10/2015			212	09/10/2015
499454	B680	264-1113	02/10/2015	07/10/2015			107	05/28/2015
499335	B682	91482PA1	02/12/2015	05/12/2015			15	02/27/2015
499417	B720	89850-8	02/12/2015	07/13/2015			146	07/08/2015
499416	B720	89850-7	02/12/2015	07/13/2015			146	07/08/2015
499415	B720	73479-15	02/16/2015	07/16/2015			143	07/09/2015
499779	B680	79766-5	03/02/2015	08/03/2015			151	07/31/2015
499775	B680	79766-1	03/02/2015	08/03/2015			151	07/31/2015
500445	B680	86174-3	03/04/2015	08/04/2015			90	06/02/2015
500138	B680	86174-4	03/04/2015	08/04/2015			90	06/02/2015
500392	B680	62097-29	03/19/2015	08/19/2015			141	08/07/2015
500395	B720	89850-9	03/19/2015	08/19/2015			141	08/07/2015
500394	B720	89850-10	03/19/2015	08/19/2015			141	08/07/2015
502353	B682	73748PA1	03/25/2015	06/25/2015			79	06/12/2015
502455	B682	524PA9	04/07/2015	07/07/2015			90	07/06/2015
503369	B680	264-1159	05/04/2015	10/05/2015			149	09/30/2015
503569	B614.2	91201PA1	05/11/2015	08/11/2015			73	07/23/2015
503585	B720	73479-16	05/11/2015	10/13/2015			134	09/22/2015
503908	B670	8281-I	05/25/2015	12/28/2015			51	07/15/2015
504896	B682	89668PA1	05/27/2015	08/27/2015			85	08/20/2015
505526	B680	84059-17	07/07/2015	12/07/2015			50	08/26/2015

Table IV
Pending Action Tracking Report
Biopesticides and Pollution Prevention Division (BPPD)

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days Remaining
485531	B590	69553-L	12/13/2013	05/13/2015	04/20/2016	1	170
488439	B590	70051-RRI	03/26/2014	08/26/2015	05/01/2016	1	181
490896	B590	84059-EA	05/20/2014	10/20/2015	10/20/2016	1	353
491657	B590	90866-R	06/17/2014	11/17/2015			15
492142	B590	88031-EE	07/01/2014	12/01/2015			29
495489	B590	90809-R	10/15/2014	03/15/2016			134
495952	B590	70644-T	10/15/2014	03/15/2016			134
504923	B590	87978-G	05/27/2015	10/27/2016			360
508414	B590	90866-RA	09/01/2015	02/01/2017			457
509265	B590	91213-E	10/01/2015	03/01/2017			485
510005	B590	91197-G	10/23/2015	03/23/2017			507
509913	B590	82074-O	10/28/2015	03/28/2017			512
485533	B590.0		12/13/2013	05/13/2015	04/20/2016	1	170
488440	B590.0	70051-RRO	03/26/2014	08/26/2015	05/01/2016	1	181
488441	B590.0	4F8252	03/26/2014	08/26/2015	05/01/2016	1	181
490898	B590.0	4F8271	05/12/2014	10/13/2015	10/20/2016	2	353
491659	B590.0	90866-E	06/10/2014	11/10/2015	11/17/2015	1	15
491660	B590.0	4F8280	06/10/2014	11/10/2015	11/17/2015	1	15
492144	B590.0	88031-EG	07/01/2014	12/01/2015			29
492145	B590.0		07/01/2014	12/01/2015			29
495492	B590.0	90809-E	10/08/2014	03/08/2016	03/15/2016	1	134
495493	B590.0	4F8313	10/08/2014	03/08/2016	03/15/2016	1	134
495956	B590.0	70644-L	10/15/2014	03/15/2016			134
495960	B590.0	70644-A	10/15/2014	03/15/2016			134
495964	B590.0		10/15/2014	03/15/2016			134
504925	B590.0	87978-U	05/27/2015	10/27/2016			360
504926	B590.0		05/27/2015	10/27/2016			360
508417	B590.0	90866-RT	08/18/2015	01/18/2017	02/01/2017	1	457
508418	B590.0	5F8387	08/18/2015	01/18/2017	02/01/2017	1	457
509269	B590.0	91213-R	10/08/2015	03/08/2017			492
509270	B590.0		10/08/2015	03/08/2017			492
510007	B590.0		10/23/2015	03/23/2017			507
509915	B590.0	82074-I	10/28/2015	03/28/2017			512
509917	B590.0		10/28/2015	03/28/2017			512
489657	B600	6704-OU	10/03/2012	10/03/2013	12/18/2015	3	46
503823	B600	87472-R	05/11/2015	06/13/2016			224
505528	B600	64137-RE	06/18/2015	07/18/2016			259
510002	B600	91197-R	10/23/2015	11/23/2016			387
489659	B600.0	6704-OG	10/03/2012	10/03/2013	12/18/2015	3	46
510004	B600.0	91197-E	10/23/2015	10/24/2016			357
508469	B610	91163-EUP-R	09/18/2015	07/18/2016			259

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days Remaining
508471	B610.0	5E8397	09/04/2015	07/05/2016	07/18/2016	1	259
484371	B612	69553-U	11/20/2013	09/22/2014	11/03/2015	3	1
484373	B612	69553-E	11/20/2013	09/22/2014	11/03/2015	3	1
506061	B612	70051-REN	07/07/2015	05/09/2016			189
509278	B612	56336-TN	10/08/2015	08/08/2016			280
509555	B612	89046-RE	10/15/2015	08/15/2016			287
497071	B612.0	89046-G	10/14/2014	08/14/2016	02/21/2016	2	111
509279	B612.0	56336-TR	10/09/2015	08/09/2016	.		281
509558	B612.0	89046-I	10/15/2015	08/15/2016			287
509559	B612.0	89046-RR	10/15/2015	08/15/2016			287
509561	B612.0	89046-RG	10/15/2015	08/15/2016			287
509781	B614.4	1677PA13	10/27/2015	01/27/2016			86
509662	B621	75437-EUP-4	10/19/2015	05/19/2016			199
509664	B621	75437-EUP-5	10/19/2015	05/19/2016			199
481554	B630	73314-7	08/16/2013	09/16/2014	05/16/2016	1	196
504131	B630	69969-U	05/22/2015	06/22/2016	.		233
504131	B630	69969-U	05/22/2015	06/22/2016			233
481555	B630.0	73314-6	08/16/2013	09/16/2014	05/16/2016	1	196
481557	B630.0		08/16/2013	09/16/2014	05/16/2016	1	196
504133	B630.0		05/22/2015	06/22/2016			233
504133	B630.0		05/22/2015	06/22/2016			233
498435	B641		01/05/2015	02/05/2016			95
498710	B643	86174-3	01/15/2015	11/16/2015			14
509324	B643	87485-2	10/09/2015	08/09/2016			281
498712	B643.0	4F8342	01/08/2015	11/09/2015	11/16/2015	1	14
509325	B643.0	87485-1	10/08/2015	08/08/2016	08/09/2016	1	281
509326	B643.0	5F8407	10/08/2015	08/08/2016	08/09/2016	1	281
497006	B644	86868-L	11/19/2014	07/20/2015	11/19/2015	1	17
503405	B670	42519-GT	05/06/2015	12/07/2015			35
505483	B670	88760-A	06/18/2015	01/19/2016			78
506671	B670	89402-R	07/23/2015	02/23/2016			113
507199	B670	88760-T	08/12/2015	03/14/2016			133
508314	B670	84059-ET	09/02/2015	04/04/2016			154
508319	B670	32938-R	09/04/2015	04/04/2016			154
508320	B670	32938-E	09/04/2015	04/04/2016			154
509495	B670	6218-IA	10/16/2015	05/16/2016			196
510054	B670	69361-UO	10/26/2015	05/26/2016			206
507969	B670	55146-RLL	11/05/2015	06/06/2016			217
510340	B670	90515-E	11/09/2015	06/09/2016			220
510574	B670	8730-IE	11/16/2015	06/16/2016			227
497906	B672	82437-O	12/24/2014	01/25/2016			84
502469	B672	70310-I	04/01/2015	05/02/2016			182
502467	B672	70310-T	04/02/2015	05/02/2016			182
503996	B672	91664-R	05/21/2015	06/21/2016			232

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days Remaining
503997	B672	91664-E	05/21/2015	06/21/2016			232
505825	B672	10163-GGA	06/29/2015	07/29/2016			270
504903	B672	89600-G	08/31/2015	09/30/2016			333
507196	B672	90866-RL	09/01/2015	10/03/2016			336
509921	B672	2792-TO	10/28/2015	11/28/2016			392
510420	B672	89361-R	11/11/2015	12/12/2016			406
510423	B672	89361-E	11/11/2015	12/12/2016			406
502429	B673	70310-A	04/02/2015	02/02/2016			92
509264	B674	42519-GI	10/08/2015	02/08/2016			98
498996	B680	84059-14	02/10/2015	07/10/2015	08/31/2015	2	-63
498998	B680	84059-13	02/10/2015	07/10/2015	08/31/2015	2	-63
506082	B680	68173-1	07/08/2015	12/08/2015			36
506274	B680	98847-2	07/10/2015	12/10/2015			38
507196	B680	70759-1	08/11/2015	01/11/2016			70
510464	B680	88760-5	11/13/2015	04/13/2016			163
504895	B681	73314-2	05/27/2015	12/28/2015			56
509006	B681	62097-26	10/01/2015	05/02/2016			182
509661	B681	82100-2	10/20/2015	05/20/2016			200
510099	B710	53575-UA	11/03/2015	03/03/2016			122
507785	B720	80286-EG	08/27/2015	01/27/2016			86
508883	B720	56336-AI	09/24/2015	02/24/2016			114
508885	B720	56336-AO	09/24/2015	02/24/2016			114
508886	B720	73479-RT	09/24/2015	02/24/2016			114
508887	B720	73479-RI	09/24/2015	02/24/2016			114
507315	B730	52991-28	08/17/2015	01/19/2016			78
506540	B773	8917-EUP-2	07/23/2015	12/23/2015			51
506542	B773.0		07/23/2015	12/23/2015			51
497668	B780	84427-R	12/09/2014	12/09/2015			37
508472	B851	67979-GN	09/17/2015	06/17/2016			228
503170	B880	524-AEL	04/23/2015	01/25/2016			84
503170	B880	524-AEL	04/23/2015	01/25/2016			84
503173	B880	524-AEA	04/23/2015	01/25/2016			84
504929	B885	62719-AOU	05/22/2015	02/22/2016			112
506547	B885	524-AET	07/15/2015	04/15/2016			165

Table V
Completed Action Tracking Report
FY15 Completed Actions
Registration Division (RD)

Note: * A zero (0) in the "Times Renegotiated" column, along with a date in the "Renegotiated Due Date" column indicates a case in which there are actually 2 PRIA due dates. The program software automatically assigns a PRIA due date based on the type of approval (PRIA category) requested by the initial application. Then, if the EPA determines the application includes a type of approval that would have a longer review period, a second, later date is assigned and listed in the "Renegotiated Due Date" column, even though no actual renegotiation has occurred.

For example, if a registrant submits an application to amend the product formulation to change an inert ingredient, a PRIA due date of 4 months is assigned for the amendment. However, if the EPA determines the new inert has not been cleared and the initial request cannot be addressed until the inert is cleared, the inert clearance action has a 12 month PRIA due date. The 4 month date would be listed as the original due date and the 12 month due date would be listed in the renegotiated due date column, even though no actual renegotiation was required.

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
442244	R320	62719-AGO	12/03/2010	12/03/2011	02/28/2014	4	1523	02/03/2015
444200	R150	10163-322	01/26/2011	10/26/2012	04/30/2015	9	1555	04/30/2015
444201	R150.0		01/26/2011	10/26/2012	04/30/2015	9	1552	04/27/2015
447951	R320	62719-AUU	05/09/2011	05/09/2012	02/28/2014	3	1366	02/03/2015
449853	R170.2	59639-150	07/19/2011	10/11/2012	06/18/2015	5	1353	04/02/2015
455245	R190	59639-173	10/18/2011	01/18/2013	06/18/2015	5	1262	04/02/2015
455247	R190.0	59639-152	10/18/2011	01/18/2013	06/18/2015	4	1262	04/02/2015
455248	R190.0	59639-150	10/18/2011	01/18/2013	06/18/2015	4	1262	04/02/2015
455249	R190.0		10/18/2011	01/18/2013	06/18/2015	4	1267	04/07/2015
456480	R350	62719-640	11/04/2011	07/04/2012	02/28/2014	4	1187	02/03/2015
457755	R311	62719-649	12/07/2011	12/07/2012	02/28/2014	3	1043	10/15/2014
459387	R350	59639-152	01/19/2012	09/19/2012	06/18/2015	5	1169	04/02/2015
459388	R350.0	59639-150	01/19/2012	09/19/2012	06/18/2015	5	1169	04/02/2015
463009	R292.0		04/02/2012	02/02/2013	06/18/2015	5	1095	04/02/2015
463487	R350	10163-297	05/01/2012	01/01/2013	04/30/2015	9	1092	04/28/2015
465534	R320	432-1582	03/04/2013	03/04/2014	09/04/2015	6	886	08/07/2015
465774	R170.2	66330-65	06/25/2012	09/18/2013	10/16/2014	3	829	10/02/2014
465775	R170.0	66330-64	06/25/2012	09/18/2013	10/16/2014	3	829	10/02/2014
465776	R170.0		06/25/2012	09/18/2013	10/16/2014	3	828	10/01/2014
466415	R350	66330-64	07/16/2012	03/16/2013	10/16/2014	4	808	10/02/2014
469567	R292	59639-173	04/02/2012	02/02/2013	06/18/2015	4	1095	04/02/2015
470627	R292		10/18/2012	08/18/2013	10/31/2014	6	741	10/29/2014
470867	R010	100-1467	10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470870	R010.0	100-1462	10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470871	R010.0	100-1463	10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470872	R010.0	100-1466	10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470873	R010.0	100-1465	10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470874	R010.0		10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
470875	R010.0		10/30/2012	10/30/2014	04/24/2015	3	906	04/24/2015
471296	R350	1021-2562	11/15/2012	07/15/2013	10/31/2014	7	713	10/29/2014
471297	R350.0	1021-1795	11/15/2012	07/15/2013	10/31/2014	7	713	10/29/2014

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
471592	R333	9349-O	01/03/2013	11/04/2013	12/04/2014	1	692	11/26/2014
471642	R020	264-1143	10/30/2012	04/30/2014	01/15/2015	3	807	01/15/2015
471643	R020.0	264-1141	10/30/2012	04/30/2014	01/15/2015	3	807	01/15/2015
471644	R020.0	264-RRUE	10/30/2012	04/30/2014	01/15/2015	3	807	01/15/2015
471647	R020.0		10/30/2012	04/30/2014	01/15/2015	3	807	01/15/2015
473377	R010	100-1478	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473378	R010.0	100-1471	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473379	R010.0	100-1476	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473380	R010.0	100-1475	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473381	R010.0	100-1480	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473382	R010.0		12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473383	R010.0		12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473384	R010.1	100-1477	01/04/2013	01/05/2015	08/28/2015	3	966	08/28/2015
473385	R010.1	100-1474	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473386	R010.1	100-1479	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473387	R010.1	100-1472	12/18/2012	12/18/2014	08/28/2015	3	983	08/28/2015
473628	R170	100-739	01/14/2013	04/14/2014	01/30/2015	3	744	01/28/2015
473631	R170.0	100-1262	01/09/2013	04/09/2014	01/30/2015	3	749	01/28/2015
473632	R170.0		01/09/2013	04/09/2014	01/30/2015	3	749	01/28/2015
474283	R010	71512-21	02/12/2013	02/12/2015	08/06/2015	2	889	07/21/2015
474285	R010.0		02/12/2013	02/12/2015	08/06/2015	2	889	07/21/2015
474286	R010.0	71512-22	02/12/2013	02/12/2015	08/06/2015	2	889	07/21/2015
474287	R010.0	71512-23	02/12/2013	02/12/2015	08/06/2015	2	889	07/21/2015
474816	R060	10308-35	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474817	R060.0	10308-36	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474818	R060.0	1021-2601	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474819	R060.0	1021-2602	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474820	R060.0	1021-2603	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474821	R060.1	1021-2604	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474822	R060.1	1021-2605	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474823	R060.1	1021-2606	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
474824	R060.1	1021-2607	01/31/2013	10/31/2014	04/30/2015	2	797	04/08/2015
476296	R280		03/26/2013	12/29/2014	07/31/2015	2	854	07/30/2015
476552	R170.2	7969-283	04/05/2013	07/07/2014	10/20/2014	0	563	10/20/2014
476553	R170.0	7969-284	04/05/2013	07/07/2014	10/20/2014	0	563	10/20/2014
476555	R170.0		04/05/2013	07/07/2014	10/20/2014	1	563	10/20/2014
476890	R310	62719-675	04/16/2013	11/18/2013	11/18/2014	1	580	11/17/2014
478936	R290		05/25/2013	09/25/2014	11/06/2014	1	491	10/29/2014
478963	R230	264-1049	06/06/2013	09/08/2014	11/30/2014	2	525	11/13/2014
478964	R230.1	432-1530	06/06/2013	09/08/2014	11/30/2014	2	524	11/12/2014
479264	R290.2		06/19/2013	09/19/2014	01/02/2015	3	552	12/23/2014
479716	R260	100-1506	06/28/2013	06/30/2014	01/13/2015	1	563	01/12/2015
479766	R170	62719-341	07/03/2013	10/03/2014	05/26/2015	2	671	05/05/2015
479768	R170.0	62719-363	07/03/2013	10/03/2014	05/26/2015	2	671	05/05/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
479769	R170.0		07/03/2013	10/03/2014	05/26/2015	2	686	05/20/2015
480686	R370	62719-394	07/30/2013	01/30/2015			541	01/22/2015
480739	R170.3	7969-283	09/11/2013	12/11/2014			404	10/20/2014
480740	R170.0	7969-284	07/19/2013	10/20/2014			458	10/20/2014
480741	R170.0		07/19/2013	10/20/2014			458	10/20/2014
481198	R170.2	264-1077	08/06/2013	11/06/2014	12/10/2014	2	491	12/10/2014
481199	R170.2	264-1077	08/06/2013	11/06/2014	12/10/2014	2	491	12/10/2014
481201	R170.0	264-1167	08/02/2013	11/03/2014	12/10/2014	2	495	12/10/2014
481202	R296		08/06/2013	11/06/2014	12/10/2014	2	491	12/10/2014
481204	R170.0		08/02/2013	11/03/2014	12/10/2014	2	494	12/09/2014
481206	R170.0		08/02/2013	11/03/2014	12/10/2014	2	494	12/09/2014
481208	R170.0	264-1078	08/02/2013	11/03/2014	12/10/2014	2	494	12/09/2014
481209	R350	264-1078	08/06/2013	05/06/2014	12/10/2014	2	490	12/09/2014
481212	R350.1	264-1084	08/06/2013	05/06/2014	12/10/2014	2	490	12/09/2014
481213	R350.1	264-1085	08/06/2013	05/06/2014	12/10/2014	2	490	12/09/2014
481214	R350.1	264-1090	08/06/2013	05/06/2014	12/10/2014	2	490	12/09/2014
481215	R350.1	264-1091	08/06/2013	05/06/2014	12/10/2014	2	490	12/09/2014
481262	R351	62341-15	08/15/2013	04/15/2014	11/29/2014	3	463	11/21/2014
481328	R140.0	499-569	07/29/2013	10/29/2014	12/31/2014	1	499	12/10/2014
481329	R230.0	499-569	07/29/2013	10/29/2014	12/31/2014	1	499	12/10/2014
481330	R260.0	499-569	07/29/2013	07/29/2014	12/31/2014	1	499	12/10/2014
481332	R320	499-569	07/30/2013	07/30/2014	12/31/2014	1	498	12/10/2014
481334	R140.0	499-570	07/29/2013	10/29/2014	12/31/2014	1	499	12/10/2014
481335	R230.0	499-570	07/29/2013	10/29/2014	12/31/2014	1	499	12/10/2014
481336	R260.0	499-570	07/29/2013	07/29/2014	12/31/2014	1	499	12/10/2014
481337	R320	499-570	09/03/2013	09/03/2014	12/31/2014	1	463	12/10/2014
481338	R140.0		07/29/2013	10/29/2014	12/31/2014	1	499	12/10/2014
481357	R310	1381-255	08/15/2013	03/17/2014	06/17/2015	1	669	06/15/2015
481579	R140	7969-299	08/13/2013	11/13/2014	12/31/2014	1	484	12/10/2014
481580	R230	7969-299	08/13/2013	11/13/2014	12/31/2014	1	484	12/10/2014
481581	R260	7969-299	08/13/2013	08/13/2014	12/31/2014	1	484	12/10/2014
482294	R170	7969-155	09/10/2013	12/10/2014	03/01/2015	1	528	02/20/2015
482295	R170.0	7969-156	09/10/2013	12/10/2014	03/01/2015	1	528	02/20/2015
482296	R170.0		09/10/2013	12/10/2014	03/01/2015	1	528	02/20/2015
482664	R310	90290-1	10/08/2013	05/08/2014	04/09/2015	2	541	04/02/2015
482796	R190.1	279-3594	09/27/2013	12/29/2014	01/30/2015	1	490	01/30/2015
482868	R190	4787-61	09/27/2013	12/29/2014	01/30/2015	1	490	01/30/2015
482869	R190.0	4787-55	09/27/2013	12/29/2014	01/30/2015	1	490	01/30/2015
482870	R190.0	279-3557	09/27/2013	12/29/2014	01/30/2015	1	490	01/30/2015
482871	R190.0	279-3588	09/27/2013	12/29/2014	01/30/2015	1	490	01/30/2015
482872	R190.0		09/27/2013	12/29/2014	01/30/2015	1	488	01/28/2015
483207	R314	2517-RAT	10/07/2013	06/09/2014	02/06/2015	1	372	10/14/2014
483208	R170	279-3149	10/18/2013	01/20/2015			412	12/04/2014
483229	R170.0	279-3189	10/08/2013	01/08/2015			422	12/04/2014

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
483230	R170.0	279-3220	10/08/2013	01/08/2015			422	12/04/2014
483231	R170.0	279-3370	10/08/2013	01/08/2015			422	12/04/2014
483234	R170	100-1067	10/22/2013	01/22/2015			455	01/20/2015
483237	R170.0	100-1431	10/08/2013	01/08/2015	01/22/2015	0	469	01/20/2015
483239	R170.0		10/08/2013	01/08/2015	01/22/2015	0	386	10/29/2014
483321	R299.0	100-936	10/08/2013	11/10/2014	08/10/2015	1	541	04/02/2015
483322	R299.0	100-1276	10/08/2013	11/10/2014	08/10/2015	1	541	04/02/2015
483324	R299.0	100-1458	10/08/2013	11/10/2014	08/10/2015	1	541	04/02/2015
483328	R299		10/08/2013	11/10/2014	08/10/2015	1	541	04/02/2015
483524	R370	8033-102	10/15/2013	04/15/2015			527	03/26/2015
483526	R340	2517-126	10/15/2013	02/18/2014	10/14/2014	7	364	10/14/2014
483527	R273.3	352-888	10/15/2013	10/15/2014			360	10/10/2014
483642	R230	59639-139	10/17/2013	01/20/2015			452	01/12/2015
484117	R230.0	59639-136	10/21/2013	01/21/2015			451	01/15/2015
484118	R230	63588-12	10/21/2013	01/21/2015			451	01/15/2015
484193	R310	9688-324	11/15/2013	06/16/2014	12/10/2014	2	389	12/09/2014
484273	R180	432-1534	11/20/2013	09/22/2014	03/25/2015	2	490	03/25/2015
484277	R180.0		11/13/2013	09/15/2014	03/25/2015	2	497	03/25/2015
484333	R334	35935-105	11/14/2013	10/14/2014	02/20/2015	1	428	01/16/2015
484334	R190	7969-283	11/15/2013	02/17/2015			339	10/20/2014
484337	R190.0	7969-284	11/11/2013	02/11/2015			343	10/20/2014
484338	R190.0		11/13/2013	02/13/2015			341	10/20/2014
484375	R140	43813-32	10/21/2013	01/21/2015	02/21/2015	1	485	02/18/2015
484376	R140.0		10/21/2013	01/21/2015	02/21/2015	1	480	02/13/2015
484394	R298.2	279-3125	11/15/2013	12/15/2014			391	12/11/2014
484395	R298.0	279-3426	11/13/2013	12/15/2014			393	12/11/2014
484396	R298.0	279-3126	11/13/2013	12/15/2014			393	12/11/2014
484398	R298.0		11/13/2013	12/15/2014			392	12/10/2014
484399	R140.2	100-1529	11/28/2013	03/02/2015	03/31/2015	1	483	03/26/2015
484402	R140.0		10/18/2013	01/20/2015	03/31/2015	1	524	03/26/2015
484419	R170.5	241-245	11/15/2013	02/17/2015			455	02/13/2015
484421	R175	241-245	11/15/2013	09/15/2014	02/17/2015	0	455	02/13/2015
484423	R170.0	241-418	11/13/2013	02/13/2015	03/03/2015	1	463	02/19/2015
484424	R175.0	241-418	11/13/2013	09/15/2014	03/03/2015	1	463	02/19/2015
484425	R170.0		11/13/2013	02/13/2015	02/17/2015	0	455	02/11/2015
484426	R175.0		11/13/2013	09/15/2014	02/17/2015	0	456	02/11/2015
484473	R124	89773PA1	11/22/2013	05/22/2014	03/06/2015	4	467	03/04/2015
484478	R351	19713-566	12/04/2013	08/04/2014	01/04/2015	1	330	10/30/2014
484560	R230.0	59639-140	10/17/2013	01/20/2015			452	01/12/2015
484881	R320	100-1530	12/03/2013	12/03/2014			364	12/02/2014
484887	R334	87243-2	12/03/2013	11/03/2014	02/03/2015	1	409	01/16/2015
484917	R170.3	7969-185	01/03/2014	04/03/2015			453	04/01/2015
484919	R175	7969-185	01/03/2014	11/03/2014	04/03/2015	0	453	04/01/2015
484921	R170.0	7969-258	11/25/2013	02/25/2015	04/03/2015	0	492	04/01/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
484922	R175.0	7969-258	11/25/2013	09/25/2014	04/03/2015	0	492	04/01/2015
484923	R170.0		11/25/2013	02/25/2015	04/03/2015	0	492	04/01/2015
484924	R175.0		11/25/2013	09/25/2014	04/03/2015	0	492	04/01/2015
484926	R170.3	7969-198	01/05/2014	04/06/2015			451	04/01/2015
484928	R175	7969-198	01/05/2014	11/05/2014	04/06/2015	0	451	04/01/2015
484930	R170.0	7969-199	11/27/2013	02/27/2015	04/06/2015	0	490	04/01/2015
484931	R175.0	7969-199	11/27/2013	09/29/2014	04/06/2015	0	490	04/01/2015
484932	R170.0		11/27/2013	02/27/2015	04/06/2015	0	476	03/18/2015
484933	R175.0		11/27/2013	09/29/2014	04/06/2015	0	476	03/18/2015
485125	R310	7969-GAN	06/04/2014	01/05/2015			197	12/18/2014
485126	R310	7969-GLO	06/04/2014	01/05/2015			197	12/18/2014
485293	R320	961-422	04/02/2014	04/02/2015			350	03/18/2015
485316	R290		12/13/2013	03/13/2015			451	03/09/2015
485321	R320	279-3595	12/16/2013	12/16/2014			359	12/10/2014
485368	R320	88665-2	12/16/2013	12/16/2014			365	12/16/2014
485386	R333	82633-22	12/18/2013	10/20/2014			293	10/07/2014
485388	R310	9688-325	12/20/2013	07/21/2014	11/18/2014	1	320	11/05/2014
485391	R310	9688-326	12/20/2013	07/21/2014	12/01/2014	1	339	11/24/2014
485430	R350	264-1066	12/26/2013	09/26/2014	04/27/2015	1	487	04/27/2015
485431	R350.1	264-1067	12/26/2013	09/26/2014	04/27/2015	1	487	04/27/2015
485432	R350.1	264-600	12/26/2013	09/26/2014	04/27/2015	1	487	04/27/2015
485436	R340	34704-928	12/17/2013	04/17/2014	11/17/2014	1	325	11/07/2014
485487	R333	279-3596	12/23/2013	10/23/2014			303	10/22/2014
485797	R334	85806-4	01/01/2014	12/01/2014	03/31/2015	1	453	03/30/2015
485845	R314	42750-270	02/28/2014	10/31/2014			230	10/16/2014
485920	R020	352-890	12/16/2013	06/16/2015	08/31/2015	1	623	08/31/2015
485922	R020.0	352-891	12/24/2013	06/24/2015	08/31/2015	1	615	08/31/2015
485923	R020.0	352-892	12/24/2013	06/24/2015	08/31/2015	1	615	08/31/2015
485925	R020.0		12/24/2013	06/24/2015	08/31/2015	1	611	08/27/2015
485929	R020.0	100-1532	01/03/2014	07/06/2015	08/31/2015	0	605	08/31/2015
485932	R020.0	100-1533	01/03/2014	07/06/2015	08/31/2015	0	605	08/31/2015
485964	R170.0	7969-199	11/27/2013	02/27/2015	04/03/2015	0	490	04/01/2015
485966	R175.0	7969-199	11/27/2013	09/29/2014	04/03/2015	0	490	04/01/2015
485979	R350	264-1023	01/08/2014	10/08/2014			272	10/07/2014
485980	R350.1	264-1135	01/08/2014	10/08/2014			272	10/07/2014
485981	R350.1	264-802	01/08/2014	10/08/2014			272	10/07/2014
486315	R314	90332-1	01/21/2014	09/22/2014	11/21/2014	1	297	11/14/2014
486316	R290.3		01/14/2014	04/14/2015			449	04/08/2015
486317	R334	90330-2	01/13/2014	12/15/2014	01/31/2015	1	379	01/27/2015
486388	R310	89459-4	01/24/2014	08/25/2014	11/20/2014	1	272	10/23/2014
486410	R310	90332-2	01/21/2014	08/21/2014	01/15/2015	2	330	12/17/2014
486412	R280	100-1508	01/13/2014	01/13/2015			364	01/12/2015
486420	R190	6836-107	02/18/2014	05/18/2015			454	05/18/2015
486422	R175	6836-107	02/18/2014	12/18/2014	05/18/2015	0	454	05/18/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
486424	R190.0	6836-350	01/10/2014	04/10/2015	05/18/2015	0	493	05/18/2015
486425	R175.0	6836-350	01/10/2014	11/10/2014	05/18/2015	0	493	05/18/2015
486426	R190.0		01/10/2014	04/10/2015	05/18/2015	0	418	03/04/2015
486427	R175.0		01/10/2014	11/10/2014	05/18/2015	0	418	03/04/2015
486441	R315	2596-182	01/28/2014	10/28/2014			268	10/23/2014
486442	R315.2	2596-183	01/28/2014	10/28/2014			272	10/27/2014
486443	R333	90332-G	02/03/2014	12/03/2014			273	11/03/2014
486446	R290.3		01/17/2014	04/17/2015	05/18/2015	1	461	04/23/2015
486497	R320	961-424	03/17/2014	03/17/2015			360	03/12/2015
486509	R315	2596-180	01/28/2014	10/28/2014			268	10/23/2014
486510	R315.2	2596-181	01/28/2014	10/28/2014			268	10/23/2014
486541	R314	87845-L	02/03/2014	10/03/2014			242	10/03/2014
486585	R334	64405-28	01/27/2014	12/29/2014			329	12/22/2014
486588	R334.1	64405-27	01/27/2014	12/29/2014			329	12/22/2014
486674	R170.3	100-739	01/29/2014	04/29/2015	05/14/2015	1	462	05/06/2015
486686	R170.0	100-1262	01/29/2014	04/29/2015	05/14/2015	1	462	05/06/2015
486687	R170.0	100-1312	01/29/2014	[illegible]	05/14/2015	1	462	05/06/2015
486689	R170.0	100-1313	01/29/2014	04/29/2015	05/14/2015	1	462	05/06/2015
486690	R170.0	100-1317	01/29/2014	04/29/2015	05/14/2015	1	462	05/06/2015
486691	R170.0		[illegible]	04/29/2015	05/14/2015	1	462	05/06/2015
486811	R334	86794-6	02/04/2014	01/05/2015			321	12/22/2014
486873	R310	42750-271	02/17/2014	09/17/2014	11/20/2014	1	232	10/07/2014
486884	R350	228-267	02/03/2014	11/03/2014			269	10/30/2014
486885	R350.1	71368-5	02/06/2014	11/06/2014			266	10/30/2014
486942	R352	62097-24	02/25/2014	10/27/2014			224	10/07/2014
487004	R350	352-840	02/12/2014	11/12/2014			273	11/12/2014
487006	R351	60063-11	02/12/2014	10/14/2014			237	10/07/2014
487070	R190	7969-56	03/23/2014	06/23/2015			449	06/15/2015
487072	R175	7969-56	03/23/2014	01/23/2015	06/23/2015	0	449	06/15/2015
487074	R190.0	7969-58	02/12/2014	05/12/2015	06/23/2015	0	488	06/15/2015
487075	R175.0	7969-58	02/12/2014	12/12/2014	06/23/2015	0	488	06/15/2015
487076	R190.0		[illegible]	05/12/2015	06/23/2015	0	488	06/15/2015
487077	R175.0		02/12/2014	12/12/2014	06/23/2015	0	488	06/15/2015
487154	R190	100-1140	02/17/2014	05/18/2015	06/01/2015	1	469	06/01/2015
487155	R190.0	100-1131	02/17/2014	05/18/2015	06/01/2015	1	469	06/01/2015
487156	R190.0	100-1150	02/17/2014	05/18/2015	06/01/2015	1	469	06/01/2015
487157	R190.0		02/17/2014	05/18/2015	06/01/2015	1	469	06/01/2015
487214	R334	62097-36	02/25/2014	01/26/2015	04/20/2015	1	379	03/11/2015
487216	R352	10163-317	02/20/2014	10/20/2014			242	10/20/2014
487217	R334.2	62097-38	02/20/2014	01/20/2015	04/20/2015	1	391	03/18/2015
487218	R334.1	62097-39	02/20/2014	01/20/2015	04/20/2015	1	384	03/11/2015
487219	R334	62097-35	02/25/2014	01/26/2015	04/20/2015	1	381	03/13/2015
487221	R334.2	62097-37	02/20/2014	01/20/2015	04/20/2015	2	391	03/18/2015
487223	R334	62097-42	02/25/2014	01/26/2015			295	12/17/2014

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
487225	R334.2	62097-41	02/20/2014	01/20/2015	01/26/2015	0	300	12/17/2014
487371	R333	90188-1	02/24/2014	12/24/2014			296	12/17/2014
487496	R190	11678-57	03/31/2014	06/30/2015	07/21/2015	1	471	07/15/2015
487498	R175	11678-57	03/31/2014	02/02/2015	07/21/2015	1	471	07/15/2015
487500	R190.0	66222-35	02/20/2014	05/20/2015	07/21/2015	1	510	07/15/2015
487501	R175.0	66222-35	02/20/2014	12/22/2014	07/21/2015	1	510	07/15/2015
487502	R190.0		02/20/2014	05/20/2015	07/21/2015	1	510	07/15/2015
487503	R175.0		02/20/2014	12/22/2014	07/21/2015	1	510	07/15/2015
487510	R350	62719-12	02/25/2014	11/25/2014	05/26/2015	1	434	05/05/2015
487511	R350.1	62719-302	02/25/2014	11/25/2014	05/26/2015	1	434	05/05/2015
487513	R350.1	62719-348	02/25/2014	11/25/2014	05/26/2015	1	434	05/05/2015
487522	R320	11556-185	02/25/2014	02/25/2015			364	02/24/2015
487545	R334	70506-309	03/05/2014	02/05/2015			330	01/29/2015
487569	R320X2	352-896	02/26/2014	02/26/2015			363	02/24/2015
487570	R320	352-897	02/26/2014	02/26/2015			365	02/26/2015
487572	R170.4	72078-1	04/05/2014	07/06/2015			432	06/11/2015
487574	R175	72078-1	04/05/2014	02/05/2015	07/06/2015	0	432	06/11/2015
487577	R170.0	59639-147	02/25/2014	05/26/2015	07/06/2015	0	471	06/11/2015
487578	R175.0	59639-147	02/25/2014	12/26/2014	07/06/2015	0	471	06/11/2015
487580	R170.0		02/25/2014	05/26/2015	07/06/2015	0	458	05/29/2015
487581	R175.0		02/25/2014	12/26/2014	07/06/2015	0	458	05/29/2015
487609	R350	264-809	02/12/2014	11/12/2014			258	10/28/2014
487801	R333	74530-57	03/05/2014	01/05/2015			292	12/22/2014
487890	R314	400-ANG	03/13/2014	11/13/2014			244	11/12/2014
487947	R310	2217-996	03/13/2014	10/14/2014			215	10/14/2014
487948	R210	67760-EUP-R	03/11/2014	03/11/2015			350	02/24/2015
487950	R210.0		03/11/2014	03/11/2015			351	02/25/2015
488005	R334	89609-R	03/14/2014	02/17/2015	05/05/2015	0	395	04/13/2015
488006	R314	66330-422	03/12/2014	11/12/2014			230	10/28/2014
488015	R175	100-815	04/19/2014	02/19/2015	07/20/2015	0	446	07/09/2015
488017	R190	100-815	04/19/2014	07/20/2015			446	07/09/2015
488019	R175.0	100-816	03/11/2014	01/12/2015	07/20/2015	0	485	07/09/2015
488020	R190.0	100-816	03/11/2014	06/11/2015	07/20/2015	0	485	07/09/2015
488022	R175.0		03/11/2014	01/12/2015	07/20/2015	0	484	07/08/2015
488023	R190.0		03/11/2014	06/11/2015	07/20/2015	0	484	07/08/2015
488042	R314	62719-681	03/12/2014	11/12/2014	02/10/2015	1	331	02/06/2015
488046	R333	74530-58	03/14/2014	01/14/2015			280	12/19/2014
488085	R290		03/20/2014	06/22/2015			456	06/19/2015
488247	R350	85153-3	12/18/2013	09/18/2014	05/18/2015	1	467	03/30/2015
488314	R351	67702-24	03/26/2014	11/26/2014			223	11/04/2014
488315	R310	67690-71	03/25/2014	10/27/2014			203	10/14/2014
488360	R351	89707-1	03/28/2014	11/28/2014			242	11/25/2014
488362	R314	42750-272	04/02/2014	12/02/2014			218	11/06/2014
488363	R333	90736-1	03/28/2014	01/28/2015			299	01/21/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
488364	R170.2	100-727	03/26/2014	06/26/2015			434	06/03/2015
488365	R170.0	100-1241	03/25/2014	06/25/2015			435	06/03/2015
488366	R170.0	100-949	03/25/2014	06/25/2015			435	06/03/2015
488373	R170.0		03/25/2014	06/25/2015			435	06/03/2015
488382	R351	100-1140	04/01/2014	12/01/2014			216	11/03/2014
488404	R351	42519-27	04/01/2014	12/01/2014			234	11/21/2014
488410	R333	74530-59	03/31/2014	02/02/2015			290	01/15/2015
488644	R310	33658-35	04/02/2014	11/03/2014			197	10/16/2014
488645	R310	83529-39	04/02/2014	11/03/2014			201	10/20/2014
488697	R310	83100-37	04/04/2014	11/04/2014			200	10/21/2014
488698	R351	86203-3	04/16/2014	12/16/2014			236	12/08/2014
488700	R340	5481-9026	04/03/2014	08/04/2014	12/04/2014	1	224	11/13/2014
488701	R351	42750-142	04/08/2014	12/08/2014			190	10/15/2014
488719	R310	100-1545	04/04/2014	11/04/2014			207	10/28/2014
488720	R310	100-1546	04/04/2014	11/04/2014			209	10/30/2014
488726	R170	7969-275	04/01/2014	07/01/2015			422	05/28/2015
488727	R170.0	7969-278	04/01/2014	07/01/2015			422	05/28/2015
488728	R170.0		04/01/2014	07/01/2015			386	04/22/2015
488757	R351	19713-641	04/10/2014	12/10/2014			218	11/14/2014
488940	R314	10163-331	04/10/2014	12/10/2014			244	12/10/2014
489065	R310	5481-576	04/15/2014	11/17/2014			216	11/17/2014
489068	R351	74530-16	04/15/2014	12/15/2014			232	12/03/2014
489143	R350	100-894	04/16/2014	01/16/2015			250	12/22/2014
489151	R351	19713-600	04/21/2014	12/22/2014			198	11/05/2014
489195	R310	5481-577	04/18/2014	11/18/2014			201	11/05/2014
489347	R334	7969-362	04/22/2014	03/23/2015			331	03/19/2015
489367	R190	59639-173	05/25/2014	08/25/2015			312	04/02/2015
489370	R175	59639-173	05/25/2014	03/25/2015	08/25/2015	0	312	04/02/2015
489376	R190.0	59639-150	04/16/2014	07/16/2015	08/25/2015	0	351	04/02/2015
489377	R175.0	59639-150	04/16/2014	02/17/2015	08/25/2015	0	351	04/02/2015
489379	R190.0		04/16/2014	07/16/2015	08/25/2015	0	356	04/07/2015
489380	R175.0		04/16/2014	02/17/2015	08/25/2015	0	356	04/07/2015
489392	R310	5481-578	04/22/2014	11/24/2014			212	11/20/2014
489394	R310	5481-579	04/22/2014	11/24/2014			212	11/20/2014
489430	R298		04/24/2014	05/26/2015	08/27/2015	2	469	08/06/2015
489431	R298.0	100-1001	04/18/2014	05/18/2015	08/27/2015	2	475	08/06/2015
489432	R298.0	100-1070	04/18/2014	05/18/2015	08/27/2015	2	475	08/06/2015
489548	R351	11678-75	04/23/2014	12/23/2014			197	11/06/2014
489552	R170.2	100-1381	04/23/2014	07/23/2015			456	07/23/2015
489553	R170.0	100-1374	04/23/2014	07/23/2015			456	07/23/2015
489554	R170.0		04/23/2014	07/23/2015			455	07/22/2015
489557	R350	100-993	04/21/2014	01/21/2015			274	01/20/2015
489558	R350.1	100-1101	04/25/2014	01/26/2015			270	01/20/2015
489655	R350	264-825	04/28/2014	01/28/2015			260	01/13/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
489659	R310	1021-2784	04/28/2014	11/28/2014			199	11/13/2014
489661	R310	1021-2783	04/28/2014	11/28/2014			199	11/13/2014
489675	R170.2	7969-188	06/06/2014	09/05/2015			398	07/09/2015
489679	R170.0	7969-190	04/28/2014	07/28/2015	09/08/2015	0	437	07/09/2015
489681	R170.0		04/28/2014	07/28/2015	09/08/2015	0	436	07/08/2015
489710	R334.2	2749-LAO	05/09/2014	04/09/2015			311	03/16/2015
489711	R334	2749-LAI	04/29/2014	03/30/2015			321	03/16/2015
489750	R170.2	264-1171	05/06/2014	08/06/2015			276	02/06/2015
489787	R124	4787PA5	05/01/2014	11/03/2014	02/03/2015	1	266	01/22/2015
489916	R351	19713-632	05/07/2014	01/07/2015			196	11/19/2014
489958	R290		05/06/2014	08/06/2015			325	03/27/2015
489967	R314	100-1549	05/02/2014	01/02/2015			234	12/22/2014
490014	R310	66243-4	08/14/2014	03/16/2015			195	02/25/2015
490058	R124	1007-95	05/08/2014	11/10/2014			172	10/27/2014
490128	R351	81598-9	05/09/2014	01/09/2015			215	12/10/2014
490132	R350	62719-580	05/07/2014	02/09/2015			184	11/07/2014
490143	R310	42750-273	05/19/2014	12/19/2014			213	12/18/2014
490144	R314	100-1550	05/07/2014	01/07/2015			230	12/23/2014
490191	R170.5	100-921	05/12/2014	08/12/2015	09/08/2015	1	480	09/04/2015
490192	R170.0	100-922	05/09/2014	08/10/2015	09/08/2015	2	483	09/04/2015
490193	R170.0		05/09/2014	08/10/2015	09/08/2015	1	483	09/04/2015
490285	R260	89609-R	05/05/2014	05/05/2015			343	04/13/2015
490300	R350	100-1187	04/18/2014	01/20/2015			271	01/14/2015
490301	R350.1	100-798	04/23/2014	01/23/2015			266	01/14/2015
490307	R350.1	100-801	04/23/2014	01/23/2015			266	01/14/2015
490308	R350.1	100-804	04/23/2014	01/23/2015			266	01/14/2015
490310	R350.1	100-1221	04/23/2014	01/23/2015			268	01/16/2015
490311	R350.1	100-1269	04/23/2014	01/23/2015			268	01/16/2015
490336	R314	83822-1	05/14/2014	01/14/2015			218	12/18/2014
490376	R350	5481-9027	05/19/2014	02/19/2015	05/19/2015	1	302	03/17/2015
490502	R350	70506-234	05/21/2014	02/23/2015			209	12/16/2014
490506	R333	42750-274	05/21/2014	03/23/2015			301	03/18/2015
490508	R333	35484-6	05/15/2014	03/16/2015	05/14/2015	1	327	04/07/2015
490510	R340	1021-2776	05/19/2014	09/19/2014	03/18/2015	2	291	03/06/2015
490512	R351	35935-81	05/15/2014	01/15/2015			195	11/26/2014
490524	R310	89459-9	05/19/2014	12/19/2014	02/13/2015	1	266	02/09/2015
490525	R310.1	89459-6	05/19/2014	12/19/2014	02/13/2015	1	266	02/09/2015
490526	R310.1	89459-7	05/19/2014	12/19/2014	02/13/2015	1	268	02/11/2015
490527	R310.1	89459-8	05/19/2014	12/19/2014	02/13/2015	1	268	02/11/2015
490548	R350	70506-194	05/22/2014	02/23/2015			215	12/23/2014
490549	R350	70506-236	05/23/2014	02/23/2015			207	12/16/2014
490551	R350	70506-185	05/22/2014	02/23/2015			215	12/23/2014
490558	R314	83070-11	05/20/2014	01/20/2015			240	01/15/2015
490562	R350	66222-87	05/19/2014	02/19/2015			275	02/18/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
490563	R350.1	66222-86	05/19/2014	02/19/2015			275	02/18/2015
490564	R350.1	66222-244	05/19/2014	02/19/2015			275	02/18/2015
490565	R350.1	66222-251	05/19/2014	02/19/2015			275	02/18/2015
490611	R350	10163-251	05/14/2014	02/17/2015			274	02/12/2015
490626	R320	7969-364	05/21/2014	05/21/2015			357	05/13/2015
490687	R351	82542-3	05/22/2014	01/22/2015			244	01/21/2015
490690	R314	352-900	05/22/2014	01/22/2015			244	01/21/2015
490730	R310	89459-10	05/27/2014	12/29/2014	03/29/2015	1	296	03/19/2015
490731	R310	87290-58	05/23/2014	12/23/2014			210	12/19/2014
490732	R310.1	87290-57	05/23/2014	12/23/2014			210	12/19/2014
490734	R351	63588-91	05/29/2014	01/29/2015			188	12/03/2014
490887	R350	68543-21	03/23/2014	12/23/2014			268	12/16/2014
490888	R351	264-728	05/27/2014	01/27/2015			203	12/16/2014
490893	R351	7969-226	05/13/2014	01/13/2015			196	11/25/2014
490938	R170.5	100-811	06/30/2014	09/30/2015			457	09/30/2015
490940	R175	100-811	06/30/2014	04/30/2015	09/30/2015	0	457	09/30/2015
490947	R170.0	100-828	05/22/2014	08/24/2015	09/30/2015	0	496	09/30/2015
490948	R175.0	100-828	05/22/2014	03/23/2015	09/30/2015	0	496	09/30/2015
490949	R170.0	100-953	05/22/2014	08/24/2015	09/30/2015	0	496	09/30/2015
490950	R175.0	100-953	05/22/2014	03/23/2015	09/30/2015	0	496	09/30/2015
490951	R170.0		05/22/2014	08/24/2015	09/30/2015	0	475	09/09/2015
490952	R175.0		05/22/2014	03/23/2015	09/30/2015	0	475	09/09/2015
491005	R251	59639-EUP-RO	05/27/2014	01/27/2015	02/20/2015	1	268	02/19/2015
491006	R170.0		05/22/2014	08/24/2015	09/30/2015	0	461	08/26/2015
491007	R175.0		05/22/2014	03/23/2015	09/30/2015	0	461	08/26/2015
491021	R351	81598-12	05/29/2014	01/29/2015	03/02/2015	1	250	02/03/2015
491095	R351	83558-35	05/30/2014	01/30/2015			235	01/20/2015
491097	R320	59639-202	05/30/2014	06/01/2015			362	05/27/2015
491195	R170	100-759	06/02/2014	09/02/2015			445	08/21/2015
491197	R170.0	100-758	06/02/2014	09/02/2015			445	08/21/2015
491199	R170.0		06/02/2014	09/02/2015			438	08/14/2015
491242	R310	9688-328	06/03/2014	01/05/2015			197	12/17/2014
491248	R334	90788-1	06/17/2014	05/18/2015	08/17/2015	1	405	07/27/2015
491250	R334	90788-2	06/17/2014	05/18/2015	08/17/2015	1	405	07/27/2015
491252	R334	90788-3	06/17/2014	05/18/2015	08/17/2015	1	405	07/27/2015
491256	R310	9688-327	06/03/2014	01/05/2015	03/05/2015	1	252	02/10/2015
491258	R310	100-1553	06/05/2014	01/05/2015			165	11/17/2014
491259	R314	62719-685	05/22/2014	01/22/2015	09/17/2015	0	453	08/28/2015
491284	R333	42750-280	06/11/2014	04/13/2015			299	04/06/2015
491286	R314	2217-998	06/04/2014	02/04/2015			225	01/15/2015
491297	R320	264-1173	06/20/2014	06/22/2015			207	01/13/2015
491298	R170	100-759	06/30/2014	09/30/2015			417	08/21/2015
491301	R175	100-759	06/30/2014	04/30/2015	09/30/2015	0	417	08/21/2015
491303	R170.0	100-1242	05/22/2014	08/24/2015	09/30/2015	0	456	08/21/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
491304	R175.0	100-1242	05/22/2014	03/23/2015	09/30/2015	0	456	08/21/2015
491305	R170.0		05/22/2014	08/24/2015	09/30/2015	0	449	08/14/2015
491306	R175.0		06/05/2014	04/06/2015	09/30/2015	0	435	08/14/2015
491307	R310	7969-366	06/03/2014	01/05/2015			202	12/22/2014
491308	R351	7969-348	06/13/2014	02/13/2015			222	01/21/2015
491378	R351	35935-100	06/09/2014	02/09/2015			234	01/29/2015
491379	R351	42750-249	06/13/2014	02/13/2015			216	01/15/2015
491380	R340	83222-37	06/10/2014	10/10/2014	01/22/2015	1	217	01/13/2015
491381	R310	1021-2785	06/09/2014	01/09/2015	03/20/2015	1	283	03/19/2015
491382	R310	1021-2786	06/09/2014	01/09/2015	03/20/2015	1	283	03/19/2015
491429	R310	35935-106	06/10/2014	01/12/2015			183	12/10/2014
491430	R314	9688-329	06/11/2014	02/11/2015	05/11/2015	1	322	04/29/2015
491434	R310	70506-311	06/12/2014	01/12/2015			188	12/17/2014
491452	R298		05/09/2014	06/09/2015	08/10/2015	2	446	07/29/2015
491454	R298.0	7969-306	05/09/2014	06/09/2015	08/10/2015	2	455	08/07/2015
491455	R298.0	7969-307	05/09/2014	06/09/2015	08/10/2015	2	447	07/30/2015
491456	R298.0	7969-308	05/09/2014	06/09/2015	08/10/2015	2	447	07/30/2015
491457	R298.0	7969-309	05/09/2014	06/09/2015	08/10/2015	2	455	08/07/2015
491458	R298.0	7969-311	05/09/2014	06/09/2015	08/10/2015	2	455	08/07/2015
491459	R298.0	7969-312	[illegible]	06/09/2015	08/10/2015	2	453	08/05/2015
491460	R298.0	7969-352	05/09/2014	06/09/2015	08/10/2015	2	453	08/05/2015
491609	R310	42750-281	06/23/2014	01/23/2015			213	01/22/2015
491611	R310	279-3597	06/18/2014	01/20/2015			216	01/20/2015
491648	R170	241-382	06/18/2014	09/18/2015			456	09/17/2015
491649	R170.0	241-427	06/18/2014	09/18/2015			456	09/17/2015
491650	R170.0		06/18/2014	09/18/2015			439	08/31/2015
491652	R230	100-1281	06/18/2014	09/18/2015			448	09/09/2015
491653	R230.0	100-1254	06/18/2014	09/18/2015			448	09/09/2015
491661	R333	88058-G	06/23/2014	04/23/2015			256	03/06/2015
491687	R320	7969-367	05/30/2014	06/30/2015			353	06/18/2015
491690	R310	100-1554	06/20/2014	01/20/2015			208	01/14/2015
491691	R350	71711-28	06/26/2014	03/26/2015			272	03/25/2015
491735	R352	4-488	06/12/2014	02/12/2015			239	02/06/2015
491740	R351	89117-1	07/01/2014	03/02/2015			244	03/02/2015
491743	R314	89168-37	06/23/2014	02/23/2015	04/24/2015	1	294	04/13/2015
491820	R124	7969PA18	06/25/2014	12/26/2014			170	12/12/2014
491821	R310	2517-RAO	06/20/2014	01/20/2015			116	10/14/2014
491823	R310.1	2517-RTN	06/20/2014	01/20/2015			213	01/19/2015
491886	R340	7655-1	06/30/2014	10/31/2014	12/19/2014	1	172	12/19/2014
491887	R334	1475-162	07/08/2014	06/08/2015			246	03/11/2015
491889	R334.1	1475-161	06/30/2014	06/01/2015	06/08/2015	0	254	03/11/2015
491981	R310	89168-36	06/30/2014	02/02/2015			213	01/29/2015
491991	R251	279-EUP-3	06/27/2014	02/27/2015	03/27/2015	1	269	03/23/2015
491993	R340	53883-304	06/27/2014	10/27/2014			117	10/22/2014

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
492001	R351	35935-7	06/30/2014	03/02/2015			242	02/27/2015
492105	R010	71512-21	06/30/2014	06/30/2016			386	07/21/2015
492127	R340	352-605	07/01/2014	11/03/2014	03/02/2015	1	238	02/24/2015
492129	R351	88783-4	07/04/2014	03/04/2015			237	02/26/2015
492132	R351	66330-31	07/04/2014	03/04/2015			242	03/03/2015
492133	R310	67690-72	07/07/2014	02/09/2015			213	02/05/2015
492135	R314	70506-312	07/04/2014	03/04/2015	06/04/2015	1	315	05/15/2015
492174	R340	65331-7	07/09/2014	11/10/2014			124	11/10/2014
492175	R351	279-9562	07/07/2014	03/09/2015			240	03/04/2015
492244	R350	7969-270	07/08/2014	04/08/2015	05/11/2015	1	304	05/08/2015
492310	R351	62719-335	06/27/2014	02/27/2015			231	02/13/2015
492318	R351	2935-545	07/10/2014	03/10/2015			239	03/06/2015
492319	R351	61272-7	07/09/2014	03/09/2015			243	03/09/2015
492384	R298		07/14/2014	08/14/2015			373	07/22/2015
492385	R298.0	279-3125	07/10/2014	08/10/2015	08/14/2015	0	385	07/30/2015
492386	R298.0	279-3126	07/10/2014	08/10/2015	08/14/2015	0	385	07/30/2015
492387	R298.0	279-3426	07/10/2014	08/10/2015	08/14/2015	0	385	07/30/2015
492572	R310	74530-60	07/16/2014	02/17/2015			198	01/30/2015
492596	R314	89168-38	07/18/2014	03/18/2015			243	03/18/2015
492733	R351	86203-1	07/22/2014	03/23/2015			233	03/12/2015
492735	R333	72106-8	07/29/2014	05/29/2015			304	05/29/2015
492801	R351	42750-277	07/28/2014	03/30/2015			227	03/12/2015
492804	R310	279-3598	07/23/2014	02/23/2015			215	02/23/2015
492834	R320	100-1556	10/09/2014	10/09/2015			195	04/22/2015
492889	R340	67702-22	07/29/2014	12/01/2014			64	10/01/2014
492890	R272	75753PA8	08/05/2014	11/05/2014			91	11/04/2014
492943	R340	67702-1	07/29/2014	12/01/2014			99	11/05/2014
492971	R340	89167-11	07/30/2014	12/01/2014			119	11/26/2014
492973	R352	100-1169	07/22/2014	03/23/2015			239	03/18/2015
492978	R352.1	100-1182	07/22/2014	03/23/2015			239	03/18/2015
492979	R340	53883-185	07/03/2014	11/03/2014	03/30/2015	1	228	02/16/2015
493016	R170.3	59639-210	07/25/2014	10/26/2015			144	12/16/2014
493018	R170.0	59639-208	07/28/2014	10/28/2015			141	12/16/2014
493019	R170.0	59639-209	07/28/2014	10/28/2015			141	12/16/2014
493020	R170.0		07/28/2014	10/28/2015			169	01/13/2015
493026	R314	9688-GGN	07/30/2014	03/30/2015			140	12/17/2014
493052	R310	55146-151	07/31/2014	03/02/2015			210	02/26/2015
493117	R340	100-1503	07/31/2014	12/01/2014	01/09/2015	1	160	01/07/2015
493121	R351	83520-17	08/01/2014	04/01/2015			222	03/11/2015
493142	R310	42750-284	08/22/2014	03/23/2015			209	03/19/2015
493149	R310	70506-313	08/04/2014	03/04/2015			211	03/03/2015
493158	R124	51873PA1	08/12/2014	02/12/2015			122	12/12/2014
493185	R351	83558-27	08/05/2014	04/06/2015			203	02/24/2015
493224	R350	100-1381	07/29/2014	04/29/2015			265	04/20/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
493229	R314	2217-999	07/31/2014	03/31/2015			207	02/23/2015
493230	R314.1	2217-1000	07/31/2014	03/31/2015			207	02/23/2015
493233	R290		08/07/2014	11/09/2015			174	01/28/2015
493338	R170.0		08/08/2014	11/09/2015			405	09/17/2015
493352	R350	5481-468	08/08/2014	05/08/2015	05/15/2015	1	278	05/13/2015
493353	R350.1	5481-483	08/08/2014	05/08/2015	05/15/2015	1	278	05/13/2015
493434	R340	68543-32	08/12/2014	12/12/2014			112	12/02/2014
493438	R350	71096-6	08/11/2014	05/11/2015			269	05/07/2015
493472	R320	1021-2787	08/11/2014	08/11/2015			361	08/07/2015
493474	R340	33270-10	08/13/2014	12/15/2014			120	12/11/2014
493475	R340	228-572	08/13/2014	12/15/2014			55	10/07/2014
493487	R334	91127-R	08/14/2014	07/14/2015			273	05/14/2015
493522	R272.2	2217PA1	08/19/2014	11/19/2014			71	10/29/2014
493526	R314	89459-12	09/03/2014	05/04/2015	06/19/2015	1	289	06/19/2015
493527	R340	2596-150	08/25/2014	12/26/2014			120	12/23/2014
493550	R350	61842-7	08/15/2014	05/15/2015			272	05/14/2015
493551	R350.1	61842-6	08/15/2014	05/15/2015			272	05/14/2015
493586	R340	13283-31	09/02/2014	01/02/2015			80	11/21/2014
493595	R314	524-620	08/18/2014	04/20/2015			238	04/13/2015
493617	R170.3	71711-26	08/25/2014	11/25/2015			387	09/16/2015
493618	R170.0	264-1025	08/25/2014	09/25/2015	11/25/2015	1	448	09/16/2015
493619	R170.0		08/25/2014	09/25/2015	11/25/2015	1	448	09/16/2015
493621	R314	66222-260	08/19/2014	04/20/2015			244	04/20/2015
493630	R272	72155PA8	08/19/2014	11/19/2014	12/30/2014	1	119	12/16/2014
493631	R272	72155PA7	08/19/2014	11/19/2014	12/30/2014	1	119	12/16/2014
493651	R310	53883-353	08/20/2014	03/20/2015			191	02/27/2015
493652	R340	33270-9	08/13/2014	12/15/2014			113	12/04/2014
493693	R350	5481-507	09/04/2014	06/04/2015			180	03/03/2015
493694	R351	70596-1	08/20/2014	04/20/2015			232	04/09/2015
493695	R310	81927-54	08/21/2014	03/23/2015			194	03/03/2015
493774	R351	62341-15	08/26/2014	04/27/2015			241	04/24/2015
493775	R310	432-1541	08/22/2014	03/23/2015			196	03/06/2015
493873	R340	40849-55	08/25/2014	12/26/2014			116	12/19/2014
493888	R334	87373-2	08/26/2014	07/27/2015			247	04/30/2015
493891	R310	88957-1	01/09/2015	08/10/2015			194	07/22/2015
494067	R340	61842-30	08/28/2014	12/29/2014			111	12/17/2014
494069	R350	45728-27	09/02/2014	06/02/2015			266	05/26/2015
494072	R350	45728-16	09/02/2014	06/02/2015			266	05/26/2015
494085	R310	1015-77	08/27/2014	03/27/2015			189	03/04/2015
494089	R310	42750-286	08/28/2014	04/03/2015			204	03/26/2015
494100	R333	74530-61	09/03/2014	07/06/2015			233	04/24/2015
494118	R320	84229-36	08/27/2014	08/27/2015			337	07/30/2015
494119	R320.1	84229-37	08/27/2014	08/27/2015			320	07/13/2015
494187	R340	50534-7	09/01/2014	01/02/2015			64	11/04/2014

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
494321	R314	62719-689	09/03/2014	05/04/2015			236	04/27/2015
494344	R351	83558-15	09/03/2014	05/04/2015			238	04/29/2015
494345	R351.1	83558-15	09/03/2014	05/04/2015			217	04/08/2015
494351	R351	264-566	09/03/2014	05/04/2015			211	04/02/2015
494353	R340	4822-602	09/04/2014	01/05/2015			56	10/30/2014
494354	R351	42750-170	09/09/2014	05/11/2015			163	02/19/2015
494357	R314	2217-1002	09/04/2014	05/04/2015			216	04/08/2015
494358	R314.1	2217-1001	09/04/2014	05/04/2015			216	04/08/2015
494413	R310	352-906	08/29/2014	03/30/2015			195	03/12/2015
494414	R340	67702-8	09/08/2014	01/08/2015			78	11/25/2014
494444	R340	1381-196	09/09/2014	01/09/2015	03/09/2015	1	170	02/26/2015
494499	R340	66222-251	09/10/2014	01/12/2015			103	12/22/2014
494571	R340	4822-536	09/12/2014	01/12/2015			98	12/19/2014
494572	R340	4822-395	09/12/2014	01/12/2015			98	12/19/2014
494573	R340	4822-258	09/12/2014	01/12/2015			98	12/19/2014
494574	R340	4822-276	09/12/2014	01/12/2015			98	12/19/2014
494575	R340	4822-399	09/12/2014	01/12/2015			98	12/19/2014
494576	R340	4822-397	09/12/2014	01/12/2015			98	12/19/2014
494577	R340	4822-380	09/12/2014	01/12/2015			98	12/19/2014
494578	R340	4822-543	09/12/2014	01/12/2015			98	12/19/2014
494579	R340	4822-167	09/12/2014	01/12/2015			98	12/19/2014
494581	R340	4822-415	09/12/2014	01/12/2015			98	12/19/2014
494582	R340	4822-572	09/12/2014	01/12/2015			98	12/19/2014
494584	R310	57131-I	09/16/2014	04/15/2015			24	10/10/2014
494586	R310.1	57131-T	09/19/2014	04/20/2015			21	10/10/2014
494587	R310.1	57131-O	09/19/2014	04/20/2015			21	10/10/2014
494588	R310.1	57131-RN	09/19/2014	04/20/2015			21	10/10/2014
494591	R350	264-613	09/15/2014	06/15/2015			254	05/27/2015
494616	R314	2217-1003	09/12/2014	05/12/2015			208	04/08/2015
494617	R314.1	2217-1004	09/12/2014	05/12/2015			208	04/08/2015
494632	R340	264-1067	09/08/2014	01/08/2015			85	12/02/2014
494634	R340.1	264-1066	09/08/2014	01/08/2015			122	01/08/2015
494678	R340	2596-178	09/23/2014	01/23/2015	07/01/2015	1	276	06/26/2015
494679	R340	2596-179	09/23/2014	01/23/2015	07/01/2015	1	276	06/26/2015
494680	R340	2517-63	09/15/2014	01/15/2015			122	01/15/2015
494681	R340	1021-1861	09/15/2014	01/15/2015			70	11/24/2014
494682	R310	1021-2788	09/15/2014	04/15/2015			211	04/14/2015
494694	R350	241-427	06/18/2014	03/18/2015	09/18/2015	0	457	09/18/2015
494841	R351	87829-1	09/18/2014	05/18/2015			161	02/26/2015
494843	R124	11556PA27	09/18/2014	03/18/2015			154	02/19/2015
494848	R340	2724-811	09/12/2014	01/12/2015			119	01/09/2015
494849	R340.1	2724-796	09/25/2014	01/26/2015			119	01/22/2015
494850	R340.1	2724-815	09/25/2014	01/26/2015			119	01/22/2015
494932	R340	1021-1310	09/23/2014	01/23/2015	04/23/2015	2	206	04/17/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated	Days To Complete	Completed Date
495003	R320	71995-60	09/25/2014	09/25/2015			355	09/15/2015
495004	R351	59639-107	09/25/2014	05/26/2015			243	05/26/2015
495032	R333	352-907	12/15/2014	10/15/2015			255	08/27/2015
495093	R350	100-656	09/26/2014	06/26/2015			157	03/02/2015
495154	R333	71173-E	10/01/2014	08/03/2015			308	08/03/2015
495211	R340	67702-2	09/30/2014	02/02/2015			57	11/26/2014
495214	R333	81964-6	10/01/2014	08/03/2015			253	06/11/2015
495216	R333	81964-5	10/01/2014	08/03/2015			303	07/31/2015
495233	R170.2	71711-26	11/03/2014	02/03/2016			317	09/16/2015
495235	R175	71711-26	11/03/2014	09/03/2015	02/03/2016	0	317	09/16/2015
495242	R170.0	264-1025	09/30/2014	12/31/2015	02/03/2016	1	351	09/16/2015
495244	R175.0	264-1025	09/30/2014	07/31/2015	02/03/2016	0	351	09/16/2015
495248	R170.0		09/30/2014	12/31/2015	02/03/2016	1	351	09/16/2015
495249	R175.0		09/30/2014	07/31/2015	02/03/2016	0	351	09/16/2015
495310	R351	89117-1	10/03/2014	06/03/2015			195	04/16/2015
495311	R350	10163-251	10/02/2014	07/02/2015			271	06/30/2015
495312	R340	59807-5	10/03/2014	02/03/2015			125	02/05/2015
495313	R340	59807-6	10/03/2014	02/03/2015			126	02/06/2015
495314	R310	7792-7	10/16/2014	05/18/2015			186	04/20/2015
495362	R272	8033PA3	10/08/2014	01/08/2015			57	12/04/2014
495363	R272	8033PA4	10/08/2014	01/08/2015			57	12/04/2014
495411	R314	11220-UG	10/07/2014	06/08/2015			111	01/26/2015
495450	R310	7969-GAO	10/08/2014	05/08/2015			212	05/08/2015
495452	R340	5481-9028	10/09/2014	02/09/2015			116	02/02/2015
495479	R310	71368-113	10/07/2014	05/07/2015			212	05/07/2015
495485	R310-1	71368-114	10/07/2014	05/07/2015			212	05/07/2015
495523	R340	62719-8	10/10/2014	02/10/2015			62	12/11/2014
495524	R351	35935-101	10/10/2014	06/10/2015			207	05/05/2015
495560	R310	239-2725	10/16/2014	05/18/2015			194	04/28/2015
495571	R310	53883-355	10/13/2014	05/13/2015			199	04/30/2015
495610	R314	100-1559	10/14/2014	06/15/2015			170	04/02/2015
495612	R351	11685-15	10/14/2014	06/15/2015			177	04/09/2015
495613	R351	35935-59	10/14/2014	06/15/2015			217	05/19/2015
495614	R350	100-1349	10/14/2014	07/14/2015			213	05/15/2015
495682	R314	66330-424	10/16/2014	06/16/2015			201	05/05/2015
495728	R351	87093-3	10/17/2014	06/17/2015			221	05/26/2015
495735	R340	62719-533	10/20/2014	02/20/2015			113	02/10/2015
495902	R340	67690-34	10/20/2014	02/20/2015			108	02/05/2015
495905	R350	352-597	10/20/2014	07/20/2015			211	05/19/2015
495991	R314	71368-115	10/23/2014	06/23/2015			238	06/18/2015
496058	R314	2217-1005	10/24/2014	06/24/2015			230	06/11/2015
496070	R340	961-423	10/27/2014	02/27/2015			120	02/24/2015
496075	R351	19713-59	10/29/2014	06/29/2015			161	04/08/2015
496077	R351	352-591	10/29/2014	06/29/2015			189	05/06/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
496093	R351	70506-234	11/05/2014	07/06/2015			159	04/13/2015
496094	R351.1	70506-235	11/05/2014	07/06/2015			159	04/13/2015
496211	R340	4822-597	10/29/2014	03/02/2015			108	02/12/2015
496235	R351	10163-216	10/30/2014	06/30/2015			195	05/13/2015
496244	R340	83923-2	10/31/2014	03/02/2015			101	02/09/2015
496245	R340	9688-285	10/31/2014	03/02/2015	06/02/2015	1	200	05/19/2015
496297	R272	80224-1	10/15/2014	01/15/2015	03/15/2015	1	146	03/10/2015
496310	R340	12455-142	10/31/2014	03/02/2015			112	02/20/2015
496311	R340.1	12455-120	10/31/2014	03/02/2015			112	02/20/2015
496312	R340	12455-121	11/10/2014	03/10/2015			105	02/23/2015
496314	R314	71368-116	11/04/2014	07/06/2015	08/05/2015	1	261	07/23/2015
496346	R351	91139-1	11/04/2014	07/06/2015			223	06/15/2015
496355	R340	73079-6	11/04/2014	03/04/2015	04/03/2015	1	148	04/01/2015
496356	R340	83070-1	11/04/2014	03/04/2015			112	02/24/2015
496357	R340	85905-5	11/04/2014	03/04/2015			114	02/26/2015
496409	R310	90568-R	11/11/2014	06/11/2015			212	06/11/2015
496512	R340	228-485	11/10/2014	03/10/2015	06/10/2015	1	140	03/30/2015
496513	R340	9688-322	11/10/2014	03/10/2015			119	03/09/2015
496514	R340	9688-321	11/10/2014	03/10/2015			119	03/09/2015
496515	R340	9688-313	11/10/2014	03/10/2015			113	03/03/2015
496518	R352	70506-243	11/04/2014	07/06/2015			239	07/01/2015
496519	R310	42750-290	11/14/2014	06/15/2015			210	06/12/2015
496520	R310	42750-289	11/14/2014	06/15/2015			210	06/12/2015
496570	R351	38167-31	11/14/2014	07/14/2015			143	04/06/2015
496579	R272	11556PA32	11/12/2014	02/12/2015			86	02/06/2015
496581	R333	81964-7	11/12/2014	09/14/2015			278	08/17/2015
496584	R340	69526-13	11/14/2014	03/16/2015			122	03/16/2015
496585	R340	69526-17	11/14/2014	03/16/2015			122	03/16/2015
496638	R351	74530-11	11/17/2014	07/17/2015			162	04/28/2015
496639	R351	59639-180	11/17/2014	07/17/2015			241	07/16/2015
496678	R345	1021-2564	11/17/2014	06/17/2015			101	02/26/2015
496679	R333	81598-14	11/14/2014	09/14/2015			194	05/27/2015
496682	R340	34704-867	11/18/2014	03/18/2015			-6	11/12/2014
496723	R170.2	59639-197	11/12/2014	02/12/2016			141	04/02/2015
496724	R170.0	59639-152	11/12/2014	02/12/2016			141	04/02/2015
496728	R310	60063-55	11/18/2014	06/18/2015			202	06/08/2015
496762	R340	61282-63	11/24/2014	03/24/2015			100	03/04/2015
496803	R340	89459-1	11/21/2014	03/23/2015			119	03/20/2015
496808	R351	42750-57	11/21/2014	07/21/2015			182	05/22/2015
496908	R310	239-2726	11/21/2014	06/22/2015	07/22/2015	1	241	07/20/2015
496909	R333	84229-38	11/21/2014	09/21/2015			203	06/12/2015
496912	R272	2596PA2	11/28/2014	03/02/2015	04/17/2015	1	136	04/13/2015
496922	R124	4787PA9	04/30/2014	10/31/2014	02/03/2015	1	267	01/22/2015
496923	R340	4822-561	11/24/2014	03/24/2015			106	03/10/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
496925	R351	279-9548	11/24/2014	07/24/2015			206	06/18/2015
496993	R351	11678-73	11/25/2014	07/27/2015			231	07/14/2015
496994	R351	264-343	11/24/2014	07/24/2015			171	05/14/2015
496995	R340	2724-826	11/26/2014	03/26/2015			65	01/30/2015
496996	R340	75257-1	11/24/2014	03/24/2015	06/27/2015	1	213	06/25/2015
496997	R340 1	75844-7	11/24/2014	03/24/2015	06/27/2015	1	213	06/25/2015
496998	R310	83100-40	11/25/2014	06/25/2015			119	03/24/2015
496999	R340 1	75844-8	11/24/2014	03/24/2015	06/27/2015	1	213	06/25/2015
497059	R334	80967-RL	11/26/2014	10/26/2015			42	01/07/2015
497060	R272	2724PA11	11/28/2014	03/02/2015			89	02/25/2015
497061	R350	62719-657	11/26/2014	08/26/2015			265	08/18/2015
497062	R340	9688-136	11/26/2014	03/26/2015			111	03/17/2015
497063	R351	74530-11	11/28/2014	07/28/2015			165	05/12/2015
497129	R351	82542-3	11/27/2014	07/27/2015			207	06/22/2015
497131	R340	228-528	11/26/2014	03/26/2015			63	01/28/2015
497163	R351	84229-40	11/28/2014	07/28/2015			221	07/07/2015
497164	R310	7969-371	11/28/2014	06/29/2015			193	06/09/2015
497165	R310	12455-RUU	11/28/2014	06/29/2015			102	03/10/2015
497166	R310	42750-291	12/03/2014	07/06/2015			201	06/22/2015
497175	R371	524-EUP-106	12/03/2014	06/03/2015	07/10/2015	1	219	07/10/2015
497189	R314	59639-204	11/28/2014	07/28/2015			137	04/14/2015
497190	R314	59639-205	12/01/2014	08/03/2015			134	04/14/2015
497191	R310	55146-152	12/03/2014	07/06/2015			168	05/20/2015
497285	R340	352-446	12/03/2014	04/03/2015			56	01/28/2015
497286	R351	35935-22	12/03/2014	08/03/2015			184	06/05/2015
497291	R340	1021-2609	12/01/2014	04/01/2015			120	03/31/2015
497294	R340	70506-254	12/03/2014	04/03/2015			99	03/12/2015
497299	R310	42750-292	12/05/2014	07/06/2015			188	06/11/2015
497304	R333	81598-15	12/03/2014	10/05/2015			222	07/13/2015
497398	R060	91266-1	12/08/2014	09/08/2016			92	03/10/2015
497406	R340	2217-455	12/08/2014	04/08/2015			108	03/26/2015
497407	R340	2724-822	12/10/2014	04/10/2015			51	01/30/2015
497408	R272	2596PA4	12/16/2014	03/16/2015			87	03/13/2015
497433	R351	81598-12	12/09/2014	08/10/2015			195	06/22/2015
497435	R340	239-2718	12/09/2014	04/09/2015			113	04/01/2015
497436	R340	1021-2673	12/08/2014	04/08/2015	06/10/2015	1	157	05/14/2015
497437	R340	239-2717	12/09/2014	04/09/2015			98	03/17/2015
497438	R350	352-883	12/09/2014	09/09/2015			268	09/03/2015
497439	R315	83399-15	12/05/2014	09/08/2015			277	09/08/2015
497475	R371	524-EUP-106	12/11/2014	06/11/2015			-21	11/20/2014
497481	R314	7969-372	12/10/2014	08/10/2015			230	07/28/2015
497482	R310	228-731	12/10/2014	07/10/2015			182	06/10/2015
497509	R350	62719-416	12/08/2014	09/08/2015			88	03/06/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated[1]	Days To Complete	Completed Date
497612	R340	89459-40	12/17/2014	04/17/2015			93	03/20/2015
497613	R314	1021-2790	12/12/2014	08/12/2015			224	07/24/2015
497641	R351	89275-1	12/15/2014	08/17/2015			148	05/12/2015
497645	R314	352-912	12/15/2014	08/17/2015			245	08/17/2015
497646	R351	264-1077	12/16/2014	08/17/2015			189	06/23/2015
497647	R351	81598-1	12/16/2014	08/17/2015			174	06/08/2015
497648	R310	83100-41	12/16/2014	07/16/2015			134	04/29/2015
497650	R314	2217-1006	11/27/2014	07/27/2015			242	07/27/2015
497651	R251	72500-EUP-3	12/15/2014	08/17/2015			239	08/11/2015
497654	R314 1	2217-1007	11/27/2014	07/27/2015			242	07/27/2015
497656	R175	100-936	12/15/2014	10/15/2015			108	04/02/2015
497658	R175 0	100-941	12/15/2014	10/15/2015			108	04/02/2015
497660	R175 0		12/15/2014	10/15/2015			108	04/02/2015
497702	R340	1021-1834	12/19/2014	04/20/2015			75	03/04/2015
497703	R340	4822-529	12/19/2014	04/20/2015			111	04/09/2015
497768	R340	57702-14	12/23/2014	04/23/2015			21	01/13/2015
497839	R340	73079-14	12/24/2014	04/24/2015	05/25/2015	1	148	05/21/2015
497841	R350	66330-262	12/23/2014	09/23/2015			147	05/19/2015
497913	R340	228-484	12/25/2014	04/27/2015			103	04/07/2015
497935	R250	66433-EUP-4	12/24/2014	06/24/2015	07/14/2015	1	198	07/10/2015
497955	R351	84229-30	12/26/2014	08/26/2015			137	05/12/2015
498013	R340	279-9548	11/24/2014	03/24/2015	07/24/2015	1	206	06/18/2015
498038	R340	67702-45	12/23/2014	04/23/2015			98	03/31/2015
498043	R340	87655-3	01/06/2015	05/06/2015			50	02/25/2015
498060	R351	42750-230	12/30/2014	08/31/2015			231	08/18/2015
498130	R331	59639-206	12/29/2014	03/30/2015			7	01/05/2015
498131	R331	59639-207	12/29/2014	03/30/2015			67	03/06/2015
498133	R333	85678-31	12/31/2014	11/02/2015			243	08/31/2015
498135	R340	53883-315	01/01/2015	05/01/2015			105	04/16/2015
498155	R315	91090-E	12/29/2014	09/29/2015			70	03/09/2015
498207	R310	19713-664	02/10/2015	09/10/2015	09/24/2015	1	226	09/24/2015
498209	R310	19713-665	02/10/2015	09/10/2015	09/24/2015	1	226	09/24/2015
498277	R314	2217-1008	01/05/2015	09/08/2015			214	08/07/2015
498280	R310	86468-2	01/05/2015	08/05/2015			212	08/05/2015
498345	R351	100-1198	01/02/2015	09/02/2015			195	07/16/2015
498348	R310	7969-374	01/07/2015	08/07/2015			208	08/03/2015
498406	R340	71368-25	01/07/2015	05/07/2015			85	04/02/2015
498407	R310	228-734	01/06/2015	08/06/2015			219	08/13/2015
498448	R351	100-579	01/09/2015	09/09/2015			138	05/27/2015
498515	R314	5481-585	01/12/2015	09/14/2015			228	08/28/2015
498516	R333	82633-23	01/12/2015	11/12/2015			246	09/15/2015
498531	R334	73605-I	01/12/2015	12/14/2015			46	02/27/2015
498621	R340	39039-21	01/20/2015	05/20/2015			84	04/14/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
498625	R310	74578-10	01/19/2015	08/19/2015			212	08/19/2015
498626	R272	72642PA1	01/14/2015	04/14/2015			70	03/25/2015
498628	R320	89118-3	01/14/2015	01/14/2016			121	05/15/2015
498672	R351	100-914	01/14/2015	09/14/2015			180	07/13/2015
498673	R351	59639-177	01/14/2015	09/14/2015			183	07/16/2015
498674	R340	2724-806	01/21/2015	05/21/2015			112	05/13/2015
498675	R310	39039-22	01/14/2015	08/14/2015			188	07/21/2015
498681	R333	91459-1	01/19/2015	11/19/2015			226	09/02/2015
498831	R351	70506-41	03/20/2015	11/20/2015			174	09/10/2015
498874	R340	61282-46	02/02/2015	06/02/2015			30	03/04/2015
498956	R340	5481-554	01/30/2015	06/01/2015			33	03/04/2015
498972	R340	7969-274	01/30/2015	06/01/2015			74	04/14/2015
498973	R340	279-3347	01/30/2015	06/01/2015			122	06/01/2015
499059	R351	81598-2	02/02/2015	10/02/2015			176	07/28/2015
499060	R351	19713-601	02/04/2015	10/05/2015			181	08/04/2015
499063	R310	88058-U	02/03/2015	09/03/2015			31	03/06/2015
499128	R310	239-2727	02/04/2015	09/04/2015			184	08/07/2015
499138	R340	81927-45	02/04/2015	06/04/2015			92	05/07/2015
499139	R310	100-1560	02/02/2015	09/02/2015			207	08/28/2015
499158	R351	81598-5	02/05/2015	10/05/2015			196	08/20/2015
499165	R310	100-1561	02/04/2015	09/04/2015			182	08/05/2015
499196	R340	62719-581	02/10/2015	06/10/2015			64	04/15/2015
499197	R340.1	62719-568	02/03/2015	06/03/2015	06/10/2015	0	71	04/15/2015
499198	R340.1	62719-569	02/03/2015	06/03/2015	06/10/2015	0	71	04/15/2015
499199	R340.1	62719-582	02/03/2015	06/03/2015	06/10/2015	0	71	04/15/2015
499201	R340.1	62719-643	02/03/2015	06/03/2015	06/10/2015	0	71	04/15/2015
499265	R340	12455-136	02/10/2015	06/10/2015			27	03/09/2015
499266	R340	42750-207	02/13/2015	06/15/2015			102	05/26/2015
499328	R340	64321-11	02/20/2015	06/22/2015			119	06/19/2015
499329	R340.1	64321-10	02/20/2015	06/22/2015			119	06/19/2015
499330	R351	81598-12	02/12/2015	10/13/2015			188	08/19/2015
499381	R340	1021-2781	02/11/2015	06/11/2015	10/08/2015	1	229	09/28/2015
499382	R340	2724-497	02/17/2015	06/17/2015			114	06/11/2015
499388	R310	74843-A	02/13/2015	09/14/2015			194	08/26/2015
499431	R310	90354-R	02/12/2015	09/14/2015			137	06/29/2015
499578	R351	352-399	01/29/2015	09/29/2015			162	07/10/2015
499598	R340	100-1469	02/19/2015	06/19/2015	09/19/2015	1	188	08/26/2015
499599	R340.1	100-1503	02/19/2015	06/19/2015	09/19/2015	1	188	08/26/2015
499631	R351	85678-8	02/23/2015	10/23/2015			171	08/13/2015
499653	R124	42750PA1	02/25/2015	08/25/2015			163	08/07/2015
499696	R340	538-313	02/24/2015	06/24/2015			112	06/16/2015
499697	R340	87655-3	02/24/2015	06/24/2015			37	04/02/2015
499699	R310	5905-596	02/24/2015	09/24/2015			188	08/31/2015
499704	R310	2217-1010	02/24/2015	09/24/2015			210	09/22/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated*	Days To Complete	Completed Date
499705	R310 1	2217-1009	02/24/2015	09/24/2015			210	09/22/2015
499853	R350	100-1530	02/23/2015	11/23/2015			217	09/28/2015
499890	R351	400-467	03/02/2015	11/02/2015			199	09/17/2015
499914	R340	352-528	03/03/2015	07/06/2015			64	05/06/2015
499915	R310	89459-81	03/02/2015	10/02/2015			203	09/21/2015
500023	R340	12455-89	03/02/2015	07/02/2015			71	05/12/2015
500025	R340	12455-79	03/02/2015	07/02/2015			71	05/12/2015
500027	R351	2749-93	03/05/2015	11/05/2015			159	08/11/2015
500033	R272	74720PA1	03/05/2015	06/05/2015			76	05/20/2015
500042	R314	100-RLAG	03/03/2015	11/03/2015			50	04/22/2015
500095	R124	85972PA2	03/06/2015	09/08/2015			45	04/20/2015
500217	R340	81927-23	03/11/2015	07/13/2015			64	05/14/2015
500222	R340	1381-98	03/17/2015	07/17/2015			35	04/21/2015
500223	R351	88685-3	03/12/2015	11/12/2015			135	07/24/2015
500224	R340	1381-102	03/16/2015	07/16/2015			98	06/22/2015
500245	R124	4787PA10	03/13/2015	09/14/2015			97	06/18/2015
500247	R124	67760PA5	03/11/2015	09/11/2015			161	08/19/2015
500319	R340	12455-133	04/06/2015	08/06/2015			36	05/12/2015
500383	R310	7969-375	03/19/2015	10/19/2015			145	08/11/2015
500748	R351	90188-1	03/23/2015	11/23/2015			126	07/27/2015
501246	R370	51147-9	03/13/2015	09/13/2016			90	06/11/2015
501831	R340	21165-34	03/11/2015	07/13/2015			92	06/11/2015
502388	R310	279-GUTA	04/06/2015	11/06/2015			28	05/04/2015
502391	R310	279-GUTL	04/06/2015	11/06/2015			28	05/04/2015
502425	R310	9688-GGR	04/07/2015	11/09/2015			169	09/23/2015
502466	R272	89459PA1	04/09/2015	07/09/2015			75	06/23/2015
502505	R350	71085-34	04/10/2015	01/11/2016			118	08/06/2015
502521	R340	64864-68	06/16/2015	10/16/2015			49	08/04/2015
502522	R272	9688PA1	04/10/2015	07/10/2015			68	06/17/2015
502611	R272	2596-178	04/20/2015	07/20/2015			71	06/30/2015
502613	R340	69117-2	04/13/2015	08/13/2015			112	08/03/2015
502660	R340	71376-3	04/14/2015	08/14/2015			106	07/29/2015
502661	R351	1015-76	04/16/2015	12/16/2015			131	08/25/2015
502665	R340	4-429	04/14/2015	08/14/2015			98	07/21/2015
502668	R351	1015-74	04/16/2015	12/16/2015			139	09/02/2015
502746	R333	4787-AA	04/14/2015	02/16/2016			98	07/21/2015
502794	R351	66330-332	04/16/2015	12/16/2015			116	08/10/2015
502798	R060	56228-AN	04/16/2015	01/17/2017			105	07/30/2015
502836	R310	12455-145	04/10/2015	11/10/2015			26	05/06/2015
502934	R340	279-3105	04/21/2015	08/21/2015			28	05/19/2015
502982	R340	279-3596	04/22/2015	08/24/2015			124	08/24/2015
503068	R340	4822-472	04/24/2015	08/24/2015			110	08/12/2015
503225	R340	66222-251	05/28/2015	09/28/2015			120	09/25/2015
503437	R272	11556PA34	05/06/2015	08/06/2015			64	07/09/2015

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated[1]	Days To Complete	Completed Date
503521	R340	83070-4	05/08/2015	09/08/2015			97	08/13/2015
503575	R272.4	1021PA5	07/20/2015	10/20/2015			52	09/10/2015
503576	R340	65331-8	05/11/2015	09/11/2015			87	08/06/2015
504005	R340	1381-249	05/29/2015	09/29/2015			112	09/18/2015
504887	R272	1021PA6	06/01/2015	09/01/2015			74	08/14/2015
505002	R272	432PA4	06/03/2015	09/03/2015			49	07/22/2015
505040	R340	87895-1	06/04/2015	10/05/2015			26	06/30/2015
505068	R292		06/04/2015	05/04/2016			106	09/18/2015
505593	R272.2	91605PA1	06/23/2015	09/23/2015			90	09/21/2015
506054	R331	100-1569	07/07/2015	10/07/2015			41	08/17/2015
506233	R272	8033PA7	07/16/2015	10/16/2015			46	08/31/2015
506235	R272	8033PA8	07/16/2015	10/16/2015			46	08/31/2015
506460	R272	100PA43	07/21/2015	10/21/2015			41	08/31/2015
506674	R272	86661PA1	[illegible]	10/29/2015			57	09/24/2015
507154	R340	89333-2	08/13/2015	12/14/2015			32	09/14/2015
507157	R340	89333-3	08/13/2015	12/14/2015			32	09/14/2015
508032	R310	74530-AU	09/03/2015	04/04/2016			1	09/04/2015

Table VI
Pending Action Tracking Report
Registration Division (RD)

Note: * A zero (0) in the "Times Renegotiated" column, along with a date in the "Renegotiated Due Date" column indicates a case in which there are actually 2 PRIA due dates. The program software automatically assigns a PRIA due date based on the type of approval (PRIA category) requested by the initial application. Then, if the EPA determines the application includes a type of approval that would have a longer review period, a second, later date is assigned and listed in the "Renegotiated Due Date" column, even though no actual renegotiation has occurred.

For example, if a registrant submits an application to amend the product formulation to change an inert ingredient, a PRIA due date of 4 months is assigned for the amendment. However, if the EPA determines the new inert has not been cleared and the initial request cannot be addressed until the inert is cleared, the inert clearance action has a 12 month PRIA due date. The 4 month date would be listed as the original due date and the 12 month due date would be listed in the renegotiated due date column, even though no actual renegotiation was required.

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
300664	R17.0		12/01/2005	01/14/2009	05/31/2018	3	939
300875	R29		12/01/2005	01/14/2009	05/31/2018	3	939
300876	R17.0		02/28/2006	04/13/2009	05/31/2018	2	939
361522	R17	71512-4	12/01/2005	05/19/2008	05/31/2018	4	939
361523	R17	71512-4	02/28/2006	12/20/2007	05/31/2018	5	939
362911	R17.0	71512-6	02/28/2006	12/20/2007	05/31/2018	6	939
377721	R35	71512-4	05/02/2007	12/28/2007	05/31/2018	5	939
377722	R35.0	71512-5	05/02/2007	12/28/2007	05/31/2018	5	939
390230	R170.0		03/20/2008	06/20/2009	06/29/2017	8	603
396687	R292.2	10163-169	07/30/2008	05/26/2009	04/11/2016	10	159
396721	R292.0		07/30/2008	05/26/2009	04/11/2016	10	159
402908	R170	10163-264	12/08/2008	03/08/2010	10/16/2016	9	347
402910	R170.0	10163-265	12/08/2008	03/08/2010	10/16/2016	9	347
402911	R170.0		12/08/2008	03/08/2010	10/16/2016	9	347
432752	R170	524-582	05/19/2010	08/19/2011	11/30/2014	6	-339
432753	R170.0		05/19/2010	08/19/2011	11/30/2014	6	-339
437491	R170	264-566	08/03/2010	11/03/2011	10/30/2015	5	-5
437493	R170.0	264-600	08/03/2010	11/03/2011	07/29/2016	6	268
443546	R150	352-782	01/10/2011	10/10/2012	01/10/2016	5	67
443547	R150.0	352-783	01/10/2011	10/10/2012	01/10/2016	5	67
443548	R150.0	352-785	01/10/2011	10/10/2012	01/10/2016	5	67
443549	R150.0	432-1565	01/10/2011	10/10/2012	01/10/2016	5	67
443550	R150.0	432-1566	01/10/2011	10/10/2012	01/10/2016	5	67
443551	R150.0		01/10/2011	10/10/2012	01/10/2016	5	67
443553	R150.0	352-ILR	01/10/2011	10/10/2012	01/10/2016	5	67
443799	R170	352-542	01/19/2011	04/19/2012	06/30/2016	8	239
443800	R170.0	352-541	01/19/2011	04/19/2012	06/30/2016	8	239
443801	R170.0		01/19/2011	04/19/2012	06/30/2016	8	239
456393	R170.4	279-9550	11/09/2011	02/01/2013	08/01/2016	2	271
456394	R170.0	279-3338	11/09/2011	02/01/2013	08/01/2016	2	271
456400	R170.0		11/09/2011	02/01/2013	08/01/2016	2	271
462914	R170.4	100-541	04/09/2012	07/03/2013	12/15/2016	4	407

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
462915	R170.0	100-526	04/09/2012	07/03/2013	12/15/2016	4	407
462916	R170.0	100-603	04/09/2012	07/03/2013	12/15/2016	4	407
462917	R170.0		04/09/2012	07/03/2013	12/15/2016	4	407
463710	R170	7969-GUL	06/13/2012	09/13/2013	09/13/2014	1	-417
464826	R170	524-ANO	06/01/2012	09/01/2013	09/13/2014	1	-417
467035	R230	75753-1	07/31/2012	10/31/2013	03/01/2016	6	118
467997	R180	524-582	08/21/2012	06/21/2013	11/30/2014	2	-339
467998	R180.0		08/21/2012	06/21/2013	11/30/2014	2	-339
468472	R230	75753-2	08/16/2012	11/16/2013	03/01/2016	6	118
470169	R010	62719-AAU	10/09/2012	10/09/2014	03/31/2016	3	148
470170	R010.0	62719-AAN	10/09/2012	10/09/2014	03/31/2016	3	148
470171	R010.0	62719-AAR	10/09/2012	10/09/2014	03/31/2016	3	148
470172	R010.0	62719-AAE	10/09/2012	10/09/2014	03/31/2016	3	148
470173	R010.0	62719-AAG	10/09/2012	10/09/2014	03/31/2016	3	148
470174	R010.0		10/09/2012	10/09/2014	03/31/2016	3	148
470427	R292		10/25/2012	08/25/2013	03/31/2016	4	148
472399	R170.3	62719-518	12/06/2012	03/06/2014	12/01/2015	3	27
472400	R170.0	62719-519	12/06/2012	03/06/2014	12/01/2015	3	27
472401	R170.0	62719-628	12/06/2012	03/06/2014	12/01/2015	3	27
472402	R170.0	62719-572	12/18/2012	03/18/2014	12/01/2015	3	27
472403	R170.0	62719-629	12/06/2012	03/06/2014	12/01/2015	3	27
472404	R170.0	62719-630	12/06/2012	03/06/2014	12/01/2015	3	27
472405	R170.0		12/11/2012	03/11/2014	12/01/2015	3	27
473406	R170	352-555	01/08/2013	04/08/2014	03/08/2016	5	125
473407	R170.0	352-748	01/08/2013	04/08/2014	03/08/2016	5	125
473408	R170.0		01/08/2013	04/08/2014	03/08/2016	5	125
473409	R170	352-535	01/08/2013	04/08/2014	03/08/2016	5	125
473410	R170.0	352-560	01/08/2013	04/08/2014	03/08/2016	5	125
473412	R170.0		01/08/2013	04/08/2014	03/08/2016	5	125
473571	R170.0	352-816	01/08/2013	04/08/2014	03/08/2016	5	125
474730	R110	89670-E	03/14/2013	11/14/2014	09/30/2016	2	331
474788	R110.0	89670-R	02/25/2013	10/27/2014	09/30/2016	2	331
475250	R170.0	352-816	01/08/2013	04/08/2014	03/08/2016	5	125
476007	R298		04/04/2013	05/05/2014	09/30/2016	3	331
476009	R298.0	100-1131	03/28/2013	04/28/2014	09/30/2016	3	331
476238	R140	39039-17	04/02/2013	07/02/2014	10/28/2015	4	-7
478514	R170	100-895	06/17/2013	09/17/2014	12/08/2015	5	34
478517	R170.0	100-898	05/22/2013	08/22/2014	12/08/2015	5	34
478518	R170.0	100-1154	05/22/2013	08/22/2014	12/08/2015	5	34
478519	R170.0	100-1259	05/22/2013	08/22/2014	12/08/2015	5	34
478520	R170.0		05/22/2013	08/22/2014	12/08/2015	5	34
480177	R170.4	100-895	07/22/2013	10/22/2014	12/08/2015	5	34
480178	R170.0	100-1259	07/11/2013	10/14/2014	12/08/2015	5	34
480181	R170.0	100-1350	07/11/2013	10/14/2014	12/08/2015	5	34

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
480182	R170.0	100-1351	07/11/2013	10/14/2014	12/08/2015	5	34
480183	R170.0	100-1408	07/11/2013	10/14/2014	12/08/2015	5	34
480187	R170.0	100-1439	07/11/2013	10/14/2014	12/08/2015	5	34
480190	R170.0		07/11/2013	10/14/2014	12/08/2015	5	34
480241	R230	100-RLNO	07/11/2013	10/14/2014	12/08/2015	5	34
480242	R230.1	100-RLRN	07/11/2013	10/14/2014	12/08/2015	5	34
483093	R140.0		04/02/2013	07/02/2014	10/28/2015	4	7
483213	R180.5	62719-266	10/24/2013	08/25/2014	11/30/2015	4	26
483215	R175	62719-266	10/24/2013	08/25/2014	11/30/2015	4	26
483219	R180.0	62719-497	10/08/2013	08/08/2014	11/30/2015	4	26
483220	R175.0	62719-497	10/08/2013	08/08/2014	11/30/2015	4	26
483221	R180.0	62719-621	10/08/2013	08/08/2014	11/30/2015	4	26
483223	R175.0	62719-621	10/08/2013	08/08/2014	11/30/2015	4	26
483225	R180.0		10/08/2013	08/08/2014	11/30/2015	4	26
483227	R175.0		10/08/2013	08/08/2014	11/30/2015	4	26
483245	R180.5	62719-539	10/24/2013	08/25/2014	11/30/2015	4	26
483246	R175	62719-539	10/24/2013	08/25/2014	11/30/2015	4	26
483249	R180.0	62719-541	10/08/2013	08/08/2014	11/30/2015	4	26
483250	R175.0	62719-541	10/08/2013	08/08/2014	11/30/2015	4	26
483251	R180.0	62719-545	10/08/2013	08/08/2014	11/30/2015	4	26
483252	R175.0	62719-545	10/08/2013	08/08/2014	11/30/2015	4	26
483254	R180.0		10/08/2013	08/08/2014	11/30/2015	4	26
483255	R175.0		10/08/2013	08/08/2014	11/30/2015	4	26
486549	R010	59639-ENR	01/21/2014	01/21/2016			78
486550	R010.0	59639-ROI	01/21/2014	01/21/2016			78
486551	R010.0	59639-ROO	01/21/2014	01/21/2016			78
486553	R010.0	59639-ENN	01/21/2014	01/21/2016			78
486557	R010.0		01/21/2014	01/21/2016			78
486818	R190	62719-631	02/04/2014	05/04/2015	11/04/2015	2	0
486820	R190.0	62719-623	02/03/2014	05/04/2015	11/04/2015	2	0
486821	R190.0	62719-625	02/03/2014	05/04/2015	11/04/2015	2	0
486823	R190.0		02/03/2014	05/04/2015	11/04/2015	2	0
486824	R010	71512-EL	01/13/2014	01/13/2016			70
486837	R010.0	71512-EU	01/13/2014	01/13/2016			70
486838	R010.0		01/13/2014	01/13/2016			70
486859	R170.3	71185-4	03/14/2014	06/15/2015	05/16/2016	1	194
486861	R175	71185-4	03/14/2014	01/14/2015	05/16/2016	1	194
486863	R170.0	80990-4	02/03/2014	05/04/2015	05/16/2016	1	194
486864	R175.0	80990-4	02/03/2014	12/03/2014	05/16/2016	1	194
486865	R170.0		02/03/2014	05/04/2015	05/16/2016	1	194
486866	R175.0		02/03/2014	12/03/2014	05/16/2016	1	194
487226	R350	352-532	02/19/2014	11/19/2014	12/31/2015	1	57
487564	R298	241-418	02/26/2014	03/26/2015	04/30/2016	2	178
487565	R298.0		02/26/2014	03/26/2015	04/30/2016	2	178

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
488417	R010	71512-ET	03/26/2014	03/28/2016			145
488418	R010.0	71512-EA	03/25/2014	03/25/2016			142
488420	R010.0		03/25/2014	03/25/2016			142
488478	R170	62719-53	03/14/2014	06/15/2015	12/11/2015	1	37
488479	R298		04/04/2014	05/04/2015	12/11/2015	1	37
488484	R298.0	62719-53	03/14/2014	04/14/2015	12/11/2015	1	37
488485	R170.0		03/14/2014	06/15/2015	12/11/2015	1	37
488489	R170.0	62719-37	03/14/2014	06/15/2015	12/11/2015	1	37
488490	R170.0	62719-87	03/14/2014	06/15/2015	12/11/2015	1	37
488491	R298.0	62719-37	03/14/2014	04/14/2015	12/11/2015	1	37
488494	R170.0	62719-552	03/14/2014	06/15/2015	12/11/2015	1	37
488495	R298.0	62719-552	03/14/2014	04/14/2015	12/11/2015	1	37
488497	R170.0	62719-637	03/14/2014	06/15/2015	12/11/2015	1	37
488498	R298.0	62719-87	03/14/2014	04/14/2015	12/11/2015	1	37
488500	R298.0	62719-637	03/14/2014	04/14/2015	12/11/2015	1	37
488743	R170	11678-1	05/11/2014	08/11/2015	02/07/2016	0	95
488745	R170.0	66222-58	04/02/2014	07/02/2015	02/07/2016	1	95
488746	R170.0		04/02/2014	07/02/2015	02/07/2016	1	95
488991	R200		04/10/2014	02/10/2015	12/11/2015	1	37
488992	R291		04/10/2014	07/10/2015	12/11/2015	1	37
488995	R200.0	352-856	04/10/2014	02/10/2015	12/11/2015	1	37
488996	R291.0	352-856	04/10/2014	07/10/2015	12/11/2015	1	37
489555	R273	7969-307	04/25/2014	04/27/2015	11/27/2015	4	23
489556	R273.0	7969-308	04/23/2014	04/23/2015	11/27/2015	4	23
489559	R170	270-379	04/25/2014	07/27/2015	11/27/2015	1	23
489560	R170.0	89459-2	04/23/2014	07/23/2015	11/27/2015	1	23
489561	R170.0	89459-3	04/23/2014	07/23/2015	11/27/2015	1	23
490081	R170	241-245	05/13/2014	08/13/2015	12/31/2015	1	57
490082	R298		04/16/2014	05/18/2015	12/31/2015	1	57
490083	R170.0		04/16/2014	07/16/2015	12/31/2015	1	57
490084	R298.0	241-245	04/16/2014	05/18/2015	12/31/2015	1	57
490087	R170.0	241-418	04/16/2014	07/16/2015	12/31/2015	1	57
490089	R298.0	241-418	04/16/2014	05/18/2015	12/31/2015	1	57
490184	R350X2	62719-621	04/25/2014	01/26/2015	11/30/2015	3	26
490185	R350.1	62719-545	04/25/2014	01/26/2015	11/30/2015	3	26
490186	R350.1	62719-541	04/25/2014	01/26/2015	11/30/2015	3	26
490335	R320	241-UUT	02/06/2015	02/08/2016			96
490884	R200.0	352-857	05/20/2014	03/20/2015	12/11/2015	1	37
490885	R200.0	352-859	05/20/2014	03/20/2015	12/11/2015	1	37
490886	R200.0	352-860	05/20/2014	03/20/2015	12/11/2015	1	37
490944	R170.0	100-1317	05/22/2014	08/24/2015	11/13/2015	1	9
490945	R175.0	100-1317	05/22/2014	03/23/2015	11/13/2015	1	9
490991	R170.3	100-739	06/30/2014	09/30/2015	11/13/2015	1	9
490993	R175	100-739	06/30/2014	04/30/2015	11/13/2015	1	9

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
490997	R170.0	100-1317	05/22/2014	08/24/2015	11/13/2015	1	9
490998	R175.0	100-1317	05/22/2014	03/23/2015	11/13/2015	1	9
491000	R170.0	100-1313	05/22/2014	08/24/2015	11/13/2015	1	9
491001	R175.0	100-1313	05/22/2014	03/23/2015	11/13/2015	1	9
491002	R170.0	100-1262	05/22/2014	08/24/2015	11/13/2015	1	9
491004	R175.0	100-1262	05/22/2014	03/23/2015	11/13/2015	1	9
491008	R251	59639-EUP-RI	05/27/2014	01/27/2015	02/20/2015	1	-257
491202	R170.0	66222-257	04/10/2014	07/10/2015	02/07/2016	1	95
491208	R350	264-1025	06/03/2014	03/03/2015	05/31/2015	4	209
491260	R310	62719-AIA	05/26/2014	12/26/2014	12/17/2015	1	43
491435	R320	62719-AIT	06/11/2014	06/11/2015	12/11/2015	1	37
491436	R292		06/11/2014	05/11/2015	12/11/2015	1	37
491854	R170.2	241-245	07/18/2014	10/19/2015	12/31/2015	1	57
491856	R175	241-245	07/18/2014	05/18/2015	12/31/2015	1	57
491858	R170.0	241-418	06/20/2014	09/21/2015	12/31/2015	1	57
491859	R175.0	241-418	06/20/2014	04/20/2015	12/31/2015	1	57
491860	R170.0		06/17/2014	09/17/2015	12/31/2015	1	57
491861	R175.0		06/17/2014	04/17/2015	12/31/2015	1	57
491986	R320	89118-E	07/03/2014	07/06/2015	12/14/2015	1	40
492321	R190	264-1077	06/25/2014	09/25/2015	11/05/2015	1	1
492323	R273	264-1077	06/25/2014	06/25/2015	11/05/2015	1	1
492325	R230X2	264-1077	06/25/2014	09/25/2015	12/18/2015	1	44
492326	R260	264-1077	06/25/2014	06/25/2015	12/18/2015	1	44
492327	R190.0		06/25/2014	09/25/2015	11/05/2015	1	1
492328	R298		06/25/2014	07/27/2015	11/05/2015	1	1
492329	R295		06/25/2014	09/25/2015	11/05/2015	1	1
492330	R298.0	264-1077	06/25/2014	07/27/2015	11/05/2015	1	1
492345	R190.0	264-1078	06/25/2014	09/25/2015	11/05/2015	1	1
492347	R273.0	264-1078	06/25/2014	06/25/2015	11/05/2015	1	1
492348	R298.0	264-1078	06/25/2014	07/27/2015	11/05/2015	1	1
492349	R350	264-1078	06/25/2014	03/25/2015	11/05/2015	1	1
492350	R190.0	264-1084	06/25/2014	09/25/2015	11/05/2015	1	1
492351	R350.1	264-1084	06/25/2014	03/25/2015	11/05/2015	1	1
492352	R190.0	264-1085	06/25/2014	09/25/2015	11/05/2015	1	1
492353	R350.1	264-1085	06/25/2014	03/25/2015	11/05/2015	1	1
492355	R190.0	264-1090	06/25/2014	09/25/2015	11/05/2015	1	1
492356	R350.1	264-1090	06/25/2014	03/25/2015	11/05/2015	1	1
492358	R190.0	264-1091	06/25/2014	09/25/2015	11/05/2015	1	1
492359	R350.1	264-1091	06/25/2014	03/25/2015	11/05/2015	1	1
492362	R230.1	432-RLGI	06/25/2014	09/25/2015	12/18/2015	1	44
492363	R260.1	432-RLGI	06/25/2014	06/25/2015	12/18/2015	1	44
492364	R230.0	432-RLGT	06/25/2014	09/25/2015	12/18/2015	1	44
492365	R260.0	432-RLGT	06/25/2014	06/25/2015	12/18/2015	1	44
492367	R230.1	432-RLGL	06/25/2014	09/25/2015	12/18/2015	1	44

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
492368	R260.1	432-RLGL	06/25/2014	06/25/2015	12/18/2015	1	44
492369	R230.1	432-RLGA	06/25/2014	09/25/2015	12/18/2015	1	44
492388	R190	264-776	07/08/2014	10/08/2015	11/30/2015	1	26
492389	R190.0	264-826	07/08/2014	10/08/2015	11/30/2015	1	26
492390	R190.0		07/08/2014	10/08/2015	11/30/2015	1	26
492391	R170.2	264-704	07/10/2014	10/13/2015	11/09/2015	1	5
492392	R170.0	264-788	07/10/2014	10/13/2015	11/09/2015	1	5
492473	R170	70506-174	07/15/2014	10/15/2015	07/15/2016	1	254
492474	R170.0	70506-175	07/11/2014	10/13/2015	07/15/2016	2	254
492475	R170.0	70506-176	07/11/2014	10/13/2015	07/15/2016	2	254
492476	R170.0	70506-191	07/11/2014	10/13/2015	07/15/2016	2	254
492480	R170.0		07/11/2014	10/13/2015	07/15/2016	1	254
492988	R170	4787-61	07/28/2014	10/28/2015	11/20/2015	1	16
492993	R170.0	4787-55	07/28/2014	10/28/2015	11/20/2015	1	16
492994	R170.0	279-3557	07/28/2014	10/28/2015	11/20/2015	1	16
492995	R170.0		07/28/2014	10/28/2015	11/20/2015	1	16
493329	R170.0	62719-442	08/08/2014	11/09/2015	11/12/2015	0	8
493330	R175.0	62719-442	08/08/2014	06/08/2015	11/12/2015	0	8
493436	R290		08/11/2014	11/12/2015			8
493477	R170	62719-394	08/14/2014	11/16/2015	01/12/2016	1	69
493479	R170.0	62719-578	08/12/2014	11/12/2015	01/12/2016	1	69
493480	R170.0		08/12/2014	11/12/2015	01/12/2016	1	69
493492	R170.3	264-704	08/08/2014	11/09/2015			5
493493	R175	264-704	08/08/2014	06/08/2015	11/09/2015	0	5
493497	R170.0	264-788	08/11/2014	11/12/2015			8
493498	R175.0	264-788	08/11/2014	[illegible]	11/09/2015	0	5
493499	R170.0	43813-32	08/11/2014	11/12/2015			8
493502	R175.0	43813-32	08/11/2014	06/11/2015	11/09/2015	0	5
493505	R170.0		08/13/2014	11/13/2015			9
493777	R170	62719-649	08/20/2014	11/20/2015	05/20/2016	1	198
493783	R170.0		08/20/2014	11/20/2015	05/20/2016	1	198
493877	R290		08/26/2014	11/27/2015			23
493885	R170	7969-275	08/28/2014	11/30/2015			26
493889	R170.0	7969-276	08/26/2014	11/27/2015	11/30/2015	0	26
493890	R170.0		08/26/2014	11/27/2015	11/30/2015	0	26
494108	R190	400-467	10/06/2014	[illegible]			63
494110	R175	400-467	10/06/2014	[illegible]	01/06/2016	0	63
494112	R190.0	400-461	08/29/2014	11/30/2015	01/06/2016	0	63
494113	R175.0	400-461	08/29/2014	06/29/2015	01/06/2016	0	63
494114	R190.0	400-466	08/29/2014	11/30/2015	01/06/2016	0	63
494115	R175.0	400-466	08/29/2014	06/29/2015	01/06/2016	0	63
494116	R190.0		08/29/2014	11/30/2015	01/06/2016	0	63
494117	R175.0		08/29/2014	06/29/2015	01/06/2016	0	63
494790	R298		10/03/2014	11/03/2015			-1

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
494943	R170	67690-6	09/19/2014	12/21/2015			47
494946	R170.0	67690-TG	09/19/2014	12/21/2015			47
494948	R170.0		09/19/2014	12/21/2015			47
495044	R273	100-1420	09/23/2014	09/23/2015	01/27/2016	1	84
495045	R273.0	100-1418	09/23/2014	09/23/2015	01/27/2016	1	84
495105	R170	5481-429	10/09/2014	01/11/2016			68
495110	R170.0	5481-433	09/29/2014	12/29/2015	01/11/2016	0	68
495111	R170.0		09/29/2014	12/29/2015	01/11/2016	0	68
495155	R190	100-1259	10/03/2014	01/04/2016			61
495157	R175	100-1259	10/03/2014	08/03/2015	01/04/2016	0	61
495159	R190.0	100-1439	09/25/2014	12/28/2015	01/04/2016	0	61
495160	R175.0	100-1439	09/25/2014	07/27/2015	01/04/2016	0	61
495161	R190.0	100-1154	09/25/2014	12/28/2015	01/04/2016	0	61
495162	R175.0	100-1154	09/25/2014	07/27/2015	01/04/2016	0	61
495163	R190.0	100-1408	09/25/2014	12/28/2015	01/04/2016	0	61
495164	R175.0	100-1408	09/25/2014	07/27/2015	01/04/2016	0	61
495165	R190.0	100-895	09/25/2014	12/28/2015	01/04/2016	0	61
495166	R175.0	100-895	09/25/2014	07/27/2015	01/04/2016	0	61
495167	R190.0	100-1351	09/25/2014	12/28/2015	01/04/2016	0	61
495168	R175.0	100-1351	09/25/2014	07/27/2015	01/04/2016	0	61
495169	R190.0		09/25/2014	12/28/2015	01/04/2016	0	61
495170	R175.0		09/25/2014	07/27/2015	01/04/2016	0	61
495212	R190	74054-1	10/03/2014	01/04/2016			61
495215	R190.0	66222-47	09/30/2014	12/31/2015	01/04/2016	0	61
495217	R190.0		09/30/2014	12/31/2015	01/04/2016	0	61
495325	R230	264-1049	10/03/2014	01/04/2016			61
495326	R230.1	432-RLUE	10/03/2014	01/04/2016			61
495418	R260	8033-RGR	10/09/2014	10/09/2015	01/07/2016	1	64
495615	R170	10163-277	10/14/2014	01/14/2016			71
495616	R170.0		10/14/2014	01/14/2016			71
495737	R170	100-1120	11/03/2014	02/03/2016			91
495739	R175	100-1120	11/03/2014	09/03/2015	02/03/2016	0	91
495741	R170.0	100-1220	10/17/2014	01/19/2016	02/03/2016	0	91
495742	R175.0	100-1220	10/17/2014	08/17/2015	02/03/2016	0	91
495745	R170.0	100-1098	10/17/2014	01/19/2016	02/03/2016	0	91
495746	R175.0	100-1098	10/17/2014	08/17/2015	02/03/2016	0	91
495749	R170.0		10/16/2014	01/19/2016	02/03/2016	0	91
495750	R175.0		10/16/2014	08/17/2015	02/03/2016	0	91
496001	R250	100-EUP-RRA	10/20/2014	04/20/2015	11/20/2015	2	16
496138	R170.3	100-1418	11/20/2014	02/22/2016			110
496146	R170.0	100-1420	10/27/2014	01/27/2016	02/22/2016	0	110
496154	R170.0		10/27/2014	01/27/2016	02/22/2016	0	110
496163	R190	100-618	11/03/2014	02/03/2016			91
496165	R175	100-618	11/03/2014	09/03/2015	02/03/2016	0	91

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
496167	R190.0	100-617	10/27/2014	01/27/2016	02/03/2016	0	91
496168	R175.0	100-617	10/27/2014	08/27/2015	02/03/2016	0	91
496169	R190.0	100-1178	10/27/2014	01/27/2016	02/03/2016	0	91
496170	R175.0	100-1178	10/27/2014	08/27/2015	02/03/2016	0	91
496171	R190.0	100-1312	10/27/2014	01/27/2016	02/03/2016	0	91
496172	R175.0	100-1312	10/27/2014	08/27/2015	02/03/2016	0	91
496173	R190.0	100-1324	10/27/2014	01/27/2016	02/03/2016	0	91
496174	R175.0	100-1324	10/27/2014	08/27/2015	02/03/2016	0	91
496175	R190.0		10/27/2014	01/27/2016	02/03/2016	0	91
496176	R175.0		10/27/2014	08/27/2015	02/03/2016	0	91
496473	R314	83070-RE	11/10/2014	07/10/2015	12/01/2015	1	27
496478	R230	7969-312	11/05/2014	02/05/2016			93
496479	R260	7969-312	11/05/2014	11/05/2015	02/05/2016	0	93
496481	R230.0	7969-GTN	11/05/2014	02/05/2016			93
496482	R260.0	7969-GTN	11/05/2014	11/05/2015	02/05/2016	0	93
496677	R230	53883-GLT	11/13/2014	02/16/2016			104
496903	R320	2792-TI	12/30/2014	12/30/2015			56
496910	R334	81964-I	11/21/2014	10/21/2015	03/31/2016	1	148
497002	R170	100-791	11/24/2014	02/24/2016			112
497003	R170.0	100-799	11/24/2014	02/24/2016			112
497005	R170.0		11/24/2014	02/24/2016			112
497245	R190	100-1001	12/31/2014	03/31/2016	08/31/2017	1	666
497252	R190.0	100-1070	12/01/2014	03/01/2016	08/31/2017	2	666
497255	R190.0		12/01/2014	03/01/2016	08/31/2017	2	666
497260	R292		12/01/2014	11/02/2015	01/04/2016	1	61
497340	R292		12/05/2014	11/05/2015	03/23/2016	0	140
497341	R292.0	100-1254	12/05/2014	11/05/2015	03/23/2016	0	140
497343	R190	62719-499	12/12/2014	03/14/2016			131
497345	R175	62719-499	12/12/2014	10/13/2015	03/14/2016	0	131
497350	R190.0	62719-611	12/05/2014	03/07/2016	03/14/2016	0	131
497351	R175.0	62719-611	12/05/2014	10/05/2015	03/14/2016	0	131
497353	R190.0		12/05/2014	03/07/2016	03/14/2016	0	131
497354	R175.0		12/05/2014	10/05/2015	03/14/2016	0	131
497614	R314.2	1021-ETOR	12/16/2014	08/17/2015	12/17/2015	1	43
497615	R320	228-TGE	07/20/2015	07/20/2016			259
497714	R334	264-RRIR	12/17/2014	11/17/2015			13
497834	R170	100-1254	12/23/2014	03/23/2016			140
497835	R170.0		12/05/2014	03/07/2016	03/23/2016	0	140
497939	R170.2	100-811	01/12/2015	04/12/2016			160
497941	R170.0	100-1317	12/24/2014	03/24/2016	04/12/2016	0	160
497942	R170.0		12/24/2014	03/24/2016	04/12/2016	0	160
497956	R230	432-RLUG	12/25/2014	03/25/2016			142
497960	R190	59639-2	02/02/2015	05/02/2016			180
497962	R175	59639-2	02/02/2015	12/02/2015	05/02/2016	0	180

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
497964	R190.0	59639-3	12/25/2014	03/25/2016	05/02/2016	0	180
497965	R175.0	59639-3	12/25/2014	10/26/2015	05/02/2016	0	180
497966	R190.0	59639-83	12/25/2014	03/25/2016	05/02/2016	0	180
497967	R175.0	59639-83	12/25/2014	10/26/2015	05/02/2016	0	180
497968	R190.0	59639-132	12/25/2014	03/25/2016	05/02/2016	0	180
497969	R175.0	59639-132	12/25/2014	10/26/2015	05/02/2016	0	180
497970	R190.0	59639-148	12/25/2014	03/25/2016	05/02/2016	0	180
497971	R175.0	59639-148	12/25/2014	10/26/2015	05/02/2016	0	180
497978	R190.0		12/25/2014	03/25/2016	05/02/2016	0	180
497980	R175.0		12/25/2014	10/26/2015	05/02/2016	0	180
498134	R334	7969-GTG	01/01/2015	12/01/2015			27
498219	R170	10163-6415	12/31/2014	03/31/2016			148
498223	R170.0	10163-6414	12/30/2014	03/30/2016	03/31/2016	0	148
498225	R170.0		12/30/2014	03/30/2016	03/31/2016	0	148
498305	R333	85678-GE	01/06/2015	11/06/2015			2
498459	R170.2	62719-631	01/21/2015	04/21/2016			169
498460	R230	62719-631	01/08/2015	04/08/2016	04/21/2016	0	169
498461	R170.0	62719-625	01/08/2015	04/08/2016	04/21/2016	0	169
498463	R230.0	62719-625	01/08/2015	04/08/2016	04/21/2016	0	169
498464	R170.0	62719-623	01/08/2015	04/08/2016	04/21/2016	0	169
498465	R230.0	62719-623	01/08/2015	04/08/2016	04/21/2016	0	169
498472	R170.0		01/08/2015	04/08/2016	04/21/2016	0	169
498485	R190	279-3181	01/15/2015	04/15/2016			163
498487	R175	279-3181	01/15/2015	11/16/2015	04/15/2016	0	163
498489	R190.0	279-3194	01/02/2015	04/04/2016	04/15/2016	0	163
498490	R175.0	279-3194	01/02/2015	11/02/2015	04/15/2016	0	163
498491	R190.0	279-3242	01/02/2015	04/04/2016	04/15/2016	0	163
498492	R175.0	279-3242	01/02/2015	11/02/2015	04/15/2016	0	163
498496	R190.0	279-3276	01/02/2015	04/04/2016	04/15/2016	0	163
498499	R175.0	279-3276	01/02/2015	11/02/2015	04/15/2016	0	163
498503	R190.0	279-3241	01/02/2015	04/04/2016	04/15/2016	0	163
498505	R175.0	279-3241	01/02/2015	11/02/2015	04/15/2016	0	163
498511	R190.0		12/29/2014	03/29/2016	05/02/2016	0	180
498512	R175.0		12/29/2014	10/29/2015	05/02/2016	0	180
498527	R334	73605-A	01/12/2015	12/14/2015			40
498529	R334	73605-T	01/12/2015	12/14/2015			40
498623	R320	89118-U	01/14/2015	01/14/2016			71
498627	R334	66330-UEA	01/09/2015	12/09/2015			35
498677	R320	89118-L	01/20/2015	01/20/2016			77
498685	R315	2517-RTG	03/10/2015	12/10/2015			36
498686	R315	2517-RTL	03/10/2015	12/10/2015			36
498687	R020	524-AEG	01/08/2015	07/08/2016			247
498688	R020.0	524-AEU	01/08/2015	07/08/2016			247
498689	R020.0		01/08/2015	07/08/2016			247

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
498887	R314	264-RRIE	04/09/2015	12/09/2015			35
498900	R315	2517-RTA	03/10/2015	12/10/2015			36
498903	R315	2517-RTU	03/10/2015	12/10/2015			36
498943	R020	10163-GGG	02/02/2015	08/02/2016			272
498944	R020.0	10163-GGU	01/27/2015	07/27/2016	08/02/2016	0	272
498945	R020.0		01/27/2015	07/27/2016	08/02/2016	0	272
498948	R190	7969-312	01/30/2015	05/02/2016			180
498949	R190.0	7969-306	01/30/2015	05/02/2016			180
498950	R190.0	7969-311	01/30/2015	05/02/2016			180
498951	R190.0	7969-309	01/30/2015	05/02/2016			180
498952	R190.0		01/30/2015	05/02/2016			180
499337	R334	80967-RA	02/13/2015	01/13/2016			70
499488	R350	264-1167	02/17/2015	11/17/2015			13
499548	R350	4822-605	05/29/2015	02/29/2016			117
499556	R310	89333-U	04/17/2015	11/17/2015			13
499596	R292.0	10163-277	02/18/2015	01/19/2016			76
499597	R292		02/18/2015	01/19/2016			76
499886	R350	352-729	03/02/2015	12/02/2015			28
499913	R320	100-RLAE	03/02/2015	03/02/2016			119
499957	R170.5	71512-8	02/26/2015	05/26/2016			204
499959	R170.0	71512-1	02/27/2015	05/27/2016			205
499960	R170.0		02/27/2015	05/27/2016			205
499975	R350	42750-19	03/06/2015	12/07/2015			33
500022	R350	8033-36	03/06/2015	12/07/2015			33
500044	R350	8033-23	03/06/2015	12/07/2015			33
500366	R320	5481-LIA	03/18/2015	03/18/2016			135
500367	R314	100-RLAU	03/13/2015	11/13/2015	01/20/2016	0	77
500442	R333	70506-GRL	03/20/2015	01/20/2016			77
500443	R333	35484-T	03/19/2015	01/19/2016			76
500695	R273	264-1137	03/17/2015	03/17/2016			134
500696	R273.0	264-1169	03/17/2015	03/17/2016			134
500697	R170	59639-97	03/05/2015	06/06/2016			215
500733	R170.0	59639-99	03/05/2015	06/06/2016			215
500734	R170.0	59639-119	03/05/2015	06/06/2016			215
500735	R170.0	59639-127	03/05/2015	06/06/2016			215
500736	R170.0		03/05/2015	06/06/2016			215
500737	R314	2217-RNRE	03/12/2015	11/12/2015			8
500738	R314.1	2217-RNRR	03/12/2015	11/12/2015			8
500741	R170.2	71512-2	03/17/2015	06/17/2016			226
500742	R170.0	71512-3	03/17/2015	06/17/2016			226
500743	R170.0		03/17/2015	06/17/2016			226
500744	R180	71512-2	04/08/2015	02/08/2016			96
500746	R180.0	71512-3	03/05/2015	01/05/2016	02/08/2016	0	96

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
500747	R180.0		03/05/2015	01/05/2016	02/08/2016	0	96
501366	R351	81596-6	03/30/2015	11/30/2015			26
501383	R320	5481-LIT	03/25/2015	03/25/2016			142
501385	R333	82633-EU	03/30/2015	02/01/2016			89
501386	R320	279-GUTU	03/30/2015	03/30/2016			147
501787	R190	11678-73	03/06/2015	06/06/2016			215
501788	R190.0	66222-243	03/06/2015	06/06/2016			215
501789	R190.0	66222-EAE	03/06/2015	06/06/2016			215
501790	R320	66222-EAE	03/06/2015	03/07/2016	06/06/2016	0	215
501793	R190.0		03/06/2015	06/06/2016			215
501834	R273	264-824	03/24/2015	03/24/2016			141
501844	R351	87812-1	03/31/2015	11/30/2015			26
501846	R350	62719-631	03/16/2015	12/16/2015	04/21/2016	0	169
501847	R350.1	62719-623	04/03/2015	01/04/2016	04/21/2016	0	169
501849	R292		03/18/2015	02/18/2016	04/21/2016	0	169
501852	R273.0	264-825	03/24/2015	03/24/2016			141
502284	R351	400-585	03/31/2015	11/30/2015			26
502287	R351	62097-15	03/27/2015	11/27/2015			23
502323	R170	8033-111	04/03/2015	07/05/2016			244
502384	R350	7959-297	04/10/2015	01/11/2016			68
502427	R334	91127-E	04/07/2015	03/07/2016			124
502465	R310	400-ANL	04/08/2015	11/09/2015			5
502475	R320	100-RLAL	04/07/2015	04/07/2016			155
502606	R170	10163-283	04/08/2015	07/08/2016			247
502608	R170.0		04/08/2015	07/08/2016			247
502652	R298		04/15/2015	05/16/2016			194
502653	R298.0	10163-277	04/09/2015	05/09/2016	05/16/2016	0	194
502659	R350	12455-136	04/14/2015	01/14/2016			71
502675	R320	279-GUTT	05/06/2015	05/06/2016			184
502744	R350	8033-116	04/16/2015	01/19/2016			76
502747	R310	3282-RRU	04/20/2015	11/20/2015			16
502795	R333	82633-EL	04/16/2015	02/16/2016			104
502796	R310	87290-LO	04/15/2015	11/16/2015			12
502797	R314	71085-UN	[illegible]	12/17/2015			43
502854	R292.0	10163-250	03/04/2015	02/04/2016			92
502880	R320	100-RLAA	04/13/2015	04/13/2016			161
502883	R351	100-739	04/21/2015	12/21/2015			47
502895	R170	67690-TU	04/21/2015	07/21/2016			260
502897	R170	67690-TL	04/21/2015	07/21/2016			260
502974	R352	86794-1	06/26/2015	02/26/2016			114
502977	R352.1	86794-3	04/20/2015	12/21/2015	02/26/2016	0	114
502978	R352.1	86794-2	04/20/2015	12/21/2015	02/26/2016	0	114
502983	R340	100-1436	04/22/2015	08/24/2015	11/24/2015	2	20
502984	R340.1	100-1437	04/22/2015	08/24/2015	11/24/2015	2	20

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
502985	R310	11556-RIA	04/23/2015	11/23/2015			19
502992	R314	279-GUTI	04/23/2015	12/23/2015			49
502993	R310	70506-GRA	04/23/2015	11/23/2015			19
503063	R350	100-640	04/22/2015	01/22/2016			79
503147	R350	352-832	04/28/2015	01/28/2016			85
503273	R350	100-953	04/30/2015	02/01/2016			89
503276	R350	100-1317	04/30/2015	02/01/2016			89
503332	R351	400-97	05/04/2015	01/04/2016			61
503339	R170	100-811	04/24/2015	07/25/2016			264
503341	R170.0	100-1317	04/24/2015	07/25/2016			264
503342	R170.0	100-828	04/21/2015	07/21/2016	07/25/2016	0	264
503343	R170.0	100-953	04/24/2015	07/25/2016			264
503344	R170.0		04/24/2015	07/25/2016			264
503388	R310	83529-UU	05/04/2015	12/04/2015			30
503461	R010	71512-EI	05/05/2015	05/05/2017			548
503462	R010.0	71512-EO	05/05/2015	05/05/2017			548
503463	R010.0		05/05/2015	05/05/2017			548
503493	R314	55146-RLG	05/07/2015	01/07/2016			64
503494	R314	55146-RLU	05/07/2015	01/07/2016			64
503495	R314	62719-AOG	05/07/2015	01/07/2016			64
503517	R351X2	264-343	06/11/2015	02/11/2016			99
503525	R314	83070-RG	05/08/2015	01/08/2016			65
503526	R310	83070-RU	05/08/2015	12/08/2015			34
503578	R351	71185-4	06/02/2015	02/02/2016			90
503583	R315	83399-RA	05/08/2015	02/08/2016			96
503584	R315	83399-RT	05/08/2015	02/08/2016			96
503627	R310	83529-UA	05/11/2015	12/11/2015			37
503658	R315	91090-G	06/29/2015	03/29/2016			146
503725	R260	11556-RIT	05/14/2015	05/16/2016			194
503792	R333	81964-O	05/18/2015	03/18/2016			135
503801	R351	71185-5	06/02/2015	02/02/2016			90
503824	R314	87845-A	05/12/2015	01/12/2016			69
503827	R310	19713-ATN	05/19/2015	12/21/2015			47
503896	R350	53883-348	05/21/2015	02/22/2016			110
503944	R350	69526-13	06/01/2015	03/01/2016			118
503945	R350	69526-17	06/01/2015	03/01/2016			118
504007	R310	85787-R	05/25/2015	12/28/2015			54
504096	R333	42750-EOT	06/01/2015	04/01/2016			149
504870	R351	11603-42	05/29/2015	01/29/2016			86
504919	R350	352-885	05/28/2015	02/29/2016			117
504920	R350.1	352-886	06/03/2015	03/03/2016			120
504921	R350.1	352-887	06/03/2015	03/03/2016			120
504938	R351	73342-8	06/01/2015	02/01/2016			89
504939	R290		05/28/2015	08/29/2016			299

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
504943	R310	89168-UL	06/04/2015	01/04/2016			61
504999	R333	82542-GU	06/03/2015	04/04/2016			152
505001	R292		06/03/2015	05/03/2016			181
505023	R170.4	33906-20	06/10/2015	09/12/2016			313
505025	R175	33906-20	06/10/2015	04/11/2016	09/12/2016	0	313
505027	R170.0	81880-5	06/02/2015	09/02/2016	09/12/2016	0	313
505028	R175.0	81880-5	06/02/2015	04/04/2016	09/12/2016	0	313
505029	R170.0	81880-4	06/02/2015	09/02/2016	09/12/2016	0	313
505030	R175.0	81880-4	06/02/2015	04/04/2016	09/12/2016	0	313
505031	R170.0		06/02/2015	09/02/2016	09/12/2016	0	313
505032	R175.0		06/02/2015	04/04/2016	09/12/2016	0	313
505042	R310	538-GEI	06/04/2015	01/04/2016			61
505043	R314	42750-EOI	06/05/2015	02/05/2016			93
505067	R340	11556-185	06/05/2015	10/05/2015	11/16/2015	1	12
505154	R334	66330-UET	06/05/2015	05/05/2016			183
505193	R351	66330-65	06/09/2015	02/09/2016			97
505194	R351	89117-1	07/03/2015	03/03/2016			120
505195	R333	89966-G	06/09/2015	04/11/2016			159
505196	R334	64864-TE	06/16/2015	05/16/2016			194
505241	R333	2217-RNRG	06/11/2015	04/11/2016			159
505242	R310	7173-GNU	06/11/2015	01/11/2016			68
505243	R290.4		06/16/2015	09/16/2016			317
505331	R333	87931-RG	06/12/2015	04/12/2016			160
505332	R334	70506-GRT	06/12/2015	05/12/2016			190
505338	R314	100-RLAI	06/08/2015	02/08/2016			96
505359	R310	33427-A	06/16/2015	01/19/2016			76
505383	R170	33906-10	06/16/2015	09/16/2016			317
505386	R170.0	33906-9	06/12/2015	09/12/2016	09/16/2016	0	317
505388	R170.0		06/12/2015	09/12/2016	09/16/2016	0	317
505414	R320	62719-AOL	06/17/2015	06/17/2016			226
505487	R310	239-ETEO	06/18/2015	01/19/2016			76
505488	R315	91384-R	06/17/2015	03/17/2016			134
505489	R315	91384-E	06/17/2015	03/17/2016			134
505506	R351	42750-276	06/19/2015	02/19/2016			107
505513	R314	264-RRIU	06/19/2015	02/19/2016			107
505591	R351	264-653	06/23/2015	02/23/2016			111
505620	R350	279-3557	06/23/2015	03/23/2016			140
505691	R351	81598-8	06/26/2015	02/26/2016			114
505692	R310	239-ETGN	06/26/2015	01/26/2016			83
505730	R310	70506-GRI	06/30/2015	02/01/2016			89
505795	R350	62719-677	06/29/2015	03/29/2016			146
505847	R351	11603-44	07/01/2015	03/01/2016			118
505938	R292.2		07/15/2015	06/15/2016			224
506019	R273	59639-185	06/24/2015	06/24/2016			233

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
506020	R273.0	59639-186	06/24/2015	06/24/2016			233
506095	R292.3		07/08/2015	06/08/2016			217
506097	R292.0	352-728	07/08/2015	06/08/2016			217
506098	R175	352-728	07/08/2015	05/09/2016	06/08/2016	0	217
506100	R175.0		07/08/2015	05/09/2016	06/08/2016	0	217
506102	R292.0	352-729	07/08/2015	06/08/2016			217
506104	R175.0	352-729	07/08/2015	05/09/2016	06/08/2016	0	217
506105	R292.0	352-730	07/08/2015	06/08/2016			217
506106	R175.0	352-730	07/08/2015	05/09/2016	06/08/2016	0	217
506133	R351	89707-1	07/10/2015	03/10/2016			127
506134	R352	81824-1	07/10/2015	03/10/2016			127
506135	R340	81824-1	07/10/2015	11/10/2015	03/10/2016	0	127
506163	R333	70506-GRO	07/13/2015	05/13/2016			191
506164	R310	5905-LOT	07/13/2015	02/16/2016			104
506232	R320	7969-GTT	07/15/2015	07/15/2016			254
506325	R350	62719-375	07/16/2015	04/18/2016			166
506329	R334	88783-L	07/16/2015	06/16/2016			226
506398	R351	84009-1	07/20/2015	03/21/2016			138
506401	R310	400-ANA	07/20/2015	02/22/2016			110
506494	R340	10163-6414	07/21/2015	11/23/2015			19
506495	R340	10163-331	07/23/2015	11/23/2015			19
506517	R310	89459-IE	07/23/2015	02/23/2016			111
506523	R340	80697-4	07/23/2015	11/23/2015			19
506525	R351	42750-244	07/24/2015	03/24/2016			141
506543	R351	100-909	07/23/2015	03/23/2016			140
506544	R351.1	100-1173	07/28/2015	03/28/2016			145
506575	R340	499-507	07/15/2015	11/16/2015			12
506633	R230	7173-GNL	07/27/2015	10/27/2016			358
506635	R314	89459-IG	07/30/2015	03/30/2016			147
506644	R310	83100-UU	07/30/2015	02/29/2016			117
506645	R170.2	100-RLTN	07/31/2015	10/31/2016			362
506646	R170.0		07/23/2015	10/24/2016	10/31/2016	1	362
506653	R170.2	100-963	06/29/2015	09/29/2016			330
506656	R170.0	100-889	06/29/2015	09/29/2016			330
506661	R170.0		06/29/2015	09/29/2016			330
506675	R334	70506-GEN	07/29/2015	06/29/2016			238
506727	R334	91640-R	08/04/2015	07/05/2016			244
506729	R340	38167-35	07/29/2015	11/30/2015			26
506730	R290		07/29/2015	10/31/2016			362
506732	R290.0	264-1049	07/29/2015	10/31/2016			362
506819	R170.5	6836-107	08/10/2015	11/10/2016			372
506821	R170.0	6836-350	07/30/2015	10/31/2016	11/10/2016	1	372
506822	R170.0		07/30/2015	10/31/2016	11/10/2016	1	372

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
506880	R351	62719-109	08/05/2015	04/05/2016			153
506889	R314	1021-ETOA	08/03/2015	04/04/2016			152
506897	R310	87093-L	07/31/2015	02/29/2016			117
506908	R294		08/03/2015	08/03/2016			273
506933	R333	42750-GNE	08/06/2015	06/06/2016			215
507105	R351	35935-100	08/06/2015	04/05/2016			154
507146	R150	59639-185	08/06/2015	05/08/2017			551
507149	R150.0	59639-ERR	08/06/2015	05/08/2017			551
507151	R370	62719-21	08/11/2015	02/13/2017			467
507152	R150.0		08/06/2015	05/08/2017			551
507153	R314	89168-UA	08/10/2015	04/11/2016			159
507155	R350	83822-1	08/10/2015	05/10/2016			188
507158	R320	60063-LA	10/08/2015	10/11/2016			342
507159	R170.2	264-1118	08/10/2015	11/10/2016			372
507161	R170.0	264-1119	08/10/2015	11/10/2016			372
507163	R170.0		08/10/2015	11/10/2016			372
507209	R351	66330-403	08/12/2015	04/12/2016			160
507212	R340	81927-13	08/12/2015	12/14/2015			40
507258	R350	352-906	08/17/2015	05/17/2016			195
507262	R351	62719-539	08/13/2015	04/13/2016			161
507331	R351	100-1133	08/18/2015	04/18/2016			166
507395	R351	85806-4	08/19/2015	04/19/2016			167
507396	R320	87895-U	08/19/2015	08/19/2016			289
507476	R314	89168-UT	08/21/2015	04/21/2016			159
507597	R340	67702-14	08/24/2015	12/24/2015			50
507598	R334	11603-LG	08/24/2015	07/25/2016			264
507612	R333	7969-GTI	09/02/2015	07/05/2016			244
507655	R350	100-1253	08/25/2015	05/25/2016			203
507657	R334	90736-E	08/25/2015	07/25/2016			264
507714	R333	432-RLTU	08/28/2015	06/28/2016			237
507718	R350.1	100-1075	08/27/2015	05/27/2016			205
507719	R340	65331-4	08/10/2015	12/10/2015			36
507720	R340	61282-63	08/26/2015	12/28/2015			54
507722	R340.1	65331-5	08/10/2015	12/10/2015			36
507723	R310	1381-ELI	08/31/2015	03/31/2016			148
507757	R314	1021-ETOU	07/13/2015	03/14/2016			131
507758	R314.2	1021-ETOL	08/18/2015	04/18/2016			166
507759	R350	86203-4	08/21/2015	05/23/2016	08/22/2016	0	292
507760	R320	82392-G	08/21/2015	08/22/2016			292
507761	R320.2	86203-ET	08/21/2015	08/22/2016			292
507763	R170	11678-73	08/13/2015	11/14/2016			376
507765	R170.0	66222-EAE	08/14/2015	11/14/2016			376
507767	R170.0		08/14/2015	11/14/2016			376

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
507768	R170.2	100-1017	09/04/2015	12/05/2016			397
507772	R170.0	100-1103	08/19/2015	11/21/2016	12/05/2016	1	397
507774	R170.0	100-993	08/19/2015	11/21/2016	12/05/2016	1	397
507776	R170.0		08/19/2015	11/21/2016	12/05/2016	1	397
507778	R170	61842-21	08/17/2015	11/17/2016			379
507779	R170.0		08/17/2015	11/17/2016			379
507781	R314	2517-RTT	08/27/2015	04/27/2016			175
507796	R170	264-1118	08/05/2015	11/07/2016			369
507806	R170.0	264-1119	08/05/2015	11/07/2016			369
507809	R170.0	264-1122	08/12/2015	11/14/2016			376
507810	R170.0		08/05/2015	11/07/2016			369
507842	R170	264-776	08/05/2015	11/07/2016			369
507843	R170.0	264-1093	08/05/2015	11/07/2016			369
507844	R292		08/05/2015	07/05/2016	11/07/2016	1	369
507845	R170.0		08/05/2015	11/07/2016			369
507872	R170	264-824	08/05/2015	11/07/2016			369
507873	R170.0	264-825	08/05/2015	11/07/2016			369
507875	R298		08/05/2015	09/06/2016	11/07/2016	1	369
507876	R170.0		08/05/2015	11/07/2016			369
507878	R170.0	264-1093	08/05/2015	11/07/2016			369
507879	R298.0	264-825	08/05/2015	09/06/2016	11/07/2016	1	369
507880	R298.0	264-1122	08/12/2015	09/12/2016	11/07/2016	1	369
507881	R350	264-825	08/05/2015	05/05/2016	11/07/2016	1	369
507959	R351	62719-223	08/28/2015	04/28/2016			176
507960	R340	100-1492	08/28/2015	12/28/2015			54
507961	R351	19713-641	08/28/2015	04/28/2016			176
507970	R310	2935-LLO	09/01/2015	04/01/2016			149
507971	R314	53883-GIR	09/01/2015	05/02/2016			180
507972	R310	71368-RRT	09/01/2015	04/01/2016			149
507973	R333	74530-AE	08/31/2015	05/30/2016			239
508010	R310	5481-LON	09/01/2015	04/01/2016			149
508011	R310	5481-LOR	09/01/2015	04/01/2016			149
508030	R333	33658-GT	09/03/2015	07/05/2016			244
508031	R310	74530-AG	09/03/2015	04/04/2016			152
508037	R340	34704-871	09/02/2015	01/04/2016			61
508040	R351	8033-20	09/03/2015	05/03/2016			181
508042	R350	74779-7	09/03/2015	06/03/2016			212
508066	R298		10/27/2015	11/28/2016			390
508295	R124	88050PA1	09/09/2015	03/09/2016			126
508305	R110X2	91601-R	09/10/2015	05/10/2017			553
508307	R333	74530-AL	09/10/2015	07/11/2016			250
508309	R180	59639-107	09/21/2015	07/21/2016			260
508310	R180.0	59639-202	09/08/2015	07/08/2016	07/21/2016	0	260
508312	R180.0		09/08/2015	07/08/2016	07/21/2016	0	260

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
508366	R340	91019-1	09/04/2015	01/04/2016			61
508367	R340	91019-2	09/04/2015	01/04/2016			61
508370	R310	67702-LR	09/04/2015	04/04/2016			152
508374	R350	264-1173	09/14/2015	06/14/2016			223
508375	R272.2	1021PA9	09/14/2015	12/14/2015			40
508376	R124	91746PA1	09/14/2015	03/14/2016			131
508384	R334	33658-GI	09/11/2015	08/11/2016			281
508388	R310	80990-A	09/18/2015	04/18/2016			166
508429	R340	61282-26	09/18/2015	01/19/2016			76
508431	R190	59639-97	09/18/2015	12/19/2016			411
508433	R175	59639-97	09/18/2015	07/18/2016	12/19/2016	0	411
508435	R190.0	59639-207	09/11/2015	12/12/2016	12/19/2016	0	411
508436	R175.0	59639-207	09/11/2015	07/11/2016	12/19/2016	1	411
508437	R190.0	59639-127	09/11/2015	12/12/2016	12/19/2016	0	411
508438	R175.0	59639-127	09/11/2015	07/11/2016	12/19/2016	0	411
508439	R190.0	59639-119	09/11/2015	12/12/2016	12/19/2016	1	411
508440	R175.0	59639-119	09/11/2015	07/11/2016	12/19/2016	0	411
508441	R190.0	59639-99	09/11/2015	12/12/2016	12/19/2016	1	411
508442	R175.0	59639-99	09/11/2015	07/11/2016	12/19/2016	0	411
508443	R190.0		09/11/2015	12/12/2016	12/19/2016	1	411
508444	R175.0		09/11/2015	07/11/2016	12/19/2016	1	411
508450	R190	80289-1	09/16/2015	12/16/2016			408
508451	R190.0	80289-7	09/16/2015	12/16/2016			408
508452	R190.0	80289-8	09/16/2015	12/16/2016			408
508453	R190.0	80289-18	09/16/2015	12/16/2016			408
508454	R190.1	80289-EE	09/16/2015	12/16/2016			408
508455	R190.0		09/16/2015	12/16/2016			408
508456	R310	9688-GGG	09/16/2015	04/18/2016			166
508490	R290		09/17/2015	12/19/2016			411
508503	R272	62719PA23	09/22/2015	12/22/2015			48
508531	R351	88685-3	09/18/2015	05/18/2016			196
508532	R340	79533-2	09/18/2015	01/19/2016			76
508533	R333	74530-AA	09/18/2015	07/18/2016			257
508536	R310	89168-LN	09/17/2015	04/18/2016			166
508550	R310	91232-E	09/18/2015	04/18/2016			166
508551	R314	70506-GER	09/18/2015	05/18/2016			196
508627	R350	66222-243	09/21/2015	06/21/2016			230
508736	R351	35935-104	09/22/2015	05/23/2016			201
508737	R351	42750-249	09/21/2015	05/23/2016			201
508773	R333	66865-E	09/21/2015	07/21/2016			260
508775	R333.2	66865-G	09/21/2015	07/21/2016			260
508843	R320	53883-GIE	09/24/2015	09/26/2016			327
508848	R170	279-3460	11/02/2015	02/02/2017			456
508850	R170.0	279-3052	09/24/2015	12/27/2016	02/02/2017	0	456

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
508851	R170.0	279-3158	09/24/2015	12/27/2016	02/02/2017	0	456
508852	R170.0		09/24/2015	12/27/2016	02/02/2017	0	456
508877	R340	100-1431	09/25/2015	01/25/2016			82
508890	R351	352-639	09/24/2015	05/24/2016			202
508941	R333.30	71173-E	09/04/2015	10/05/2015			-30
508951	R334	91813-R	09/30/2015	08/31/2016			301
508955	R350	61842-9	09/29/2015	06/29/2016			238
509007	R340	352-836	09/30/2015	02/01/2016			89
509048	R333	74530-AT	10/05/2015	08/05/2016			275
509094	R334	35915-RT	10/08/2015	09/08/2016			309
509127	R351	85678-4	10/05/2015	06/06/2016			215
509129	R333	1021-ETOT	10/06/2015	08/08/2016			278
509142	R351	62097-12	10/08/2015	06/08/2016			217
509143	R334	91640-E	11/13/2015	10/13/2016			344
509266	R340	81927-55	10/09/2015	02/09/2016			97
509268	R272	90278PA1	10/08/2015	01/08/2016			65
509415	R333	82633-EA	10/12/2015	08/12/2016			282
509423	R170.5	66330-65	10/09/2015	01/09/2017			432
509424	R170.0	66330-64	10/08/2015	01/09/2017			432
509425	R170.0		10/08/2015	01/09/2017			432
509426	R351	11603-34	10/12/2015	06/13/2016			222
509427	R340	83399-15	10/14/2015	02/16/2016			104
509428	R020	62719-AOT	10/05/2015	04/05/2017			518
509429	R340	89459-81	10/15/2015	02/16/2016			104
509433	R314	55050-T	10/14/2015	06/14/2016			223
509434	R020.0	62719-AOI	10/05/2015	04/05/2017			518
509435	R333	91274-R	10/13/2015	08/15/2016			285
509437	R020.0	62719-AOO	10/05/2015	04/05/2017			518
509439	R020.0	62719-TNN	10/05/2015	04/05/2017			518
509441	R020.0	62719-TNR	10/05/2015	04/05/2017			518
509442	R331	71512-GN	10/13/2015	01/13/2016			70
509446	R020.0		10/05/2015	04/05/2017			518
509477	R350	11678-73	10/15/2015	07/15/2016			254
509478	R340	499-570	10/15/2015	02/16/2016			104
509485	R334	82534-A	10/16/2015	09/16/2016	10/17/2016	1	348
509486	R320	82534-A	10/16/2015	10/17/2016			348
509489	R334.1	82534-T	10/16/2015	09/16/2016	10/17/2016	1	348
509490	R320.1	82534-T	10/16/2015	10/17/2016			348
509491	R334.1	82534-I	10/16/2015	09/16/2016	10/17/2016	0	348
509492	R320.1	82534-I	10/16/2015	10/17/2016			348
509588	R351	71532-1	10/20/2015	06/20/2016			229
509589	R340	400-480	10/19/2015	02/19/2016			107
509590	R351	42750-260	10/27/2015	06/27/2016			236
509603	R310	9688-GGU	10/20/2015	05/20/2016			198

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
509605	R298.0	10163-277	09/03/2015	10/03/2016	11/28/2016	1	390
509620	R333	82633-ET	10/19/2015	08/19/2016			289
509634	R340	53883-330	10/19/2015	02/19/2016			107
509637	R340	53883-333	10/19/2015	02/19/2016			107
509655	R352	83558-34	10/20/2015	06/20/2016			229
509658	R310	82534-O	10/21/2015	05/23/2016			201
509698	R351	34704-1084	10/21/2015	06/21/2016			230
509701	R340	62719-591	10/23/2015	02/23/2016			111
509707	R310	5905-LOO	10/28/2015	05/31/2016			209
509711	R020	11581-L	10/21/2015	04/21/2017			534
509712	R020.0	11581-A	10/21/2015	04/21/2017			534
509713	R020.0		10/21/2015	04/21/2017			534
509715	R298.0	264-824	08/05/2015	09/06/2016	11/07/2016	1	369
509783	R020	100-RLTL	10/21/2015	04/21/2017			534
509784	R020.0	100-RLTT	10/21/2015	04/21/2017			534
509791	R020.0	100-RLTO	10/21/2015	04/21/2017			534
509793	R020.0	100-RLIN	10/21/2015	04/21/2017			534
509795	R020.0	100-RLIR	10/21/2015	04/21/2017			534
509797	R020.1	100-RLTI	10/21/2015	04/21/2017			534
509798	R020.1	100-RLIE	10/21/2015	04/21/2017			534
509799	R020.1	100-RLIG	10/21/2015	04/21/2017			534
509800	R020.1	100-RLTA	10/21/2015	04/21/2017			534
509801	R020.2	100-RLIU	10/21/2015	04/21/2017			534
509802	R020.0		10/21/2015	04/21/2017			534
509825	R351	83520-17	10/27/2015	06/27/2016			236
509830	R350	352-896	10/27/2015	07/27/2016			266
509876	R260	53883-294	10/30/2015	10/31/2016			362
509878	R351	84229-30	10/27/2015	06/27/2016			236
509879	R350	81880-18	10/28/2015	07/28/2016			267
509880	R124	45728PA1	10/27/2015	04/27/2016			175
509928	R200	264-1143	10/06/2015	08/08/2016			278
509930	R240	264-1143	10/06/2015	08/08/2016			278
509932	R270	264-1143	10/06/2015	07/06/2016	08/08/2016	0	278
509937	R350X4	264-1143	10/06/2015	07/06/2016	08/08/2016	0	278
509939	R200.0	264-1141	10/06/2015	08/08/2016			278
509941	R350	264-1141	10/06/2015	07/06/2016	08/08/2016	0	278
509944	R200.0		10/06/2015	08/08/2016			278
509946	R200.0	72155-RRA	10/06/2015	08/08/2016			278
509948	R240.1	72155-RRA	10/06/2015	08/08/2016			278
509949	R240.1	72155-RRL	10/15/2015	08/15/2016			285
509952	R200.0	432-RLTL	10/06/2015	08/08/2016			278
509953	R240.1	432-RLTL	10/06/2015	08/08/2016			278
509954	R270.0	432-RLTL	10/06/2015	07/06/2016	08/08/2016	0	278
509955	R350.14	432-RLTL	10/06/2015	07/06/2016	08/08/2016	0	278

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
510024	R340	34704-1080	10/30/2015	02/29/2016			117
510048	R314	100-RLIL	10/21/2015	06/21/2016			230
510049	R314.1	100-RLTU	10/21/2015	06/21/2016			230
510051	R170		10/29/2015	01/30/2017			453
510052	R170		10/29/2015	01/30/2017			453
510057	R310	279-GLOO	11/03/2015	06/03/2016			212
510060	R333	74530-TR	11/03/2015	09/06/2016			307
510098	R272	239-2632	11/03/2015	02/03/2016			91
510113	R351	34704-1088	11/04/2015	07/05/2016			244
510115	R292		11/04/2015	10/04/2016			335
510195	R310	70506-GEG	11/05/2015	06/06/2016			215
510198	R314	1021-ETOI	11/05/2015	07/05/2016			244
510200	R351	42750-277	11/05/2015	07/05/2016			244
510201	R310	279-GANN	11/03/2015	06/03/2016			212
510202	R333	85678-GA	11/06/2015	09/06/2016			307
510205	R272	279PA14	11/06/2015	02/08/2016			96
510261	R340	121-77	11/09/2015	03/09/2016			126
510262	R340	121-76	11/09/2015	03/09/2016			126
510263	R340	121-65	11/09/2015	03/09/2016			126
510265	R340	305-61	11/09/2015	03/09/2016			126
510266	R340	305-48	11/09/2015	03/09/2016			126
510268	R340	305-51	11/09/2015	03/09/2016			126
510269	R340	1021-2788	11/09/2015	03/09/2016			126
510271	R310	70506-GEU	11/09/2015	06/09/2016			218
510362	R272	39967PA8	11/09/2015	02/09/2016			97
510372	R315	91090-U	11/11/2015	08/11/2016			281
510417	R340	34704-568	11/12/2015	03/14/2016			131
510433	R333	89966-U	11/12/2015	09/12/2016			313
510475	R230	72500-EA	11/12/2015	02/13/2017			467
510480	R310	66330-UEO	11/13/2015	06/13/2016			222
510560	R170	71185-5	11/13/2015	02/13/2017			467
510565	R170.0	80990-1	11/13/2015	02/13/2017			467
510566	R170.0		11/13/2015	02/13/2017			467
510576	R290		11/16/2015	02/16/2017			470
510583	R333	74530-TN	11/16/2015	09/16/2016			317
510584	R333X2	74530-AO	10/16/2015	08/16/2016			286
510632	R310	72500-ET	11/18/2015	06/20/2016			229
510658	R170.3	63588-91	11/17/2015	02/17/2017			471
510659	R170.0	63588-92	11/17/2015	02/17/2017			471
510660	R170.0		11/17/2015	02/17/2017			471
510661	R320	279-GANR	11/17/2015	11/17/2016	02/17/2017	0	471
510662	R170.0	279-GANR	11/17/2015	02/17/2017			471
510663	R333	32240-I	09/29/2015	07/29/2016			268

Decision Number	PRIA Code	Reg Number	PRIA Start Date	PRIA Due Date	Negotiated Due Date	Times Renegotiated *	Days Remaining
510665	R310	60063-LT	11/19/2015	06/20/2016			229
510741	R333	42750-GNU	11/20/2015	09/20/2016			321
510742	R333	42750-GNL	11/20/2015	09/20/2016			321
510745	R340	432-1514	11/20/2015	03/21/2016			138
510746	R315	91090-L	11/20/2015	08/22/2016			292
510761	R334	90788-U	11/23/2015	10/24/2016			355
510763	R351	61272-9	11/22/2015	07/22/2016			261

Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Dr. Ronald E. Kleinman

Senator Joni Ernst

1. Dr. Kleinman, as a mother, I want to ensure that anything I feed my family is safe. How do you respond to mothers who ask you about the safety of genetically modified organisms?

I tell parents that genetically modified foods are as safe and in fact are even safer than conventionally raised foods. These are the most tested foods we've ever had available to us and that over more than 20 years, the scientific evidence is absolutely clear and the vast majority of scientists across the globe agree that there are no immediate or long term harmful effects from eating foods produced using modern biotechnology.

Senator John Thune

1. Dr. Kleinman, what do you think would be the potential to feed the world in both the near and distant future without the use of GM crops and food derived from GM plants?

Modern GM technology offers us a very important way to enhance food production in the face of adverse climate change and a shrinking base of arable farmland. It will not be possible to meet the nutritional needs of an expanding global population now or in the future without taking advantage of modern biotechnology to develop resistant and high producing seeds and other non plant food sources.

Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Mrs. Joanna Lidback

Senator Joni Ernst

1. Mrs. Lidback, can you tell me how using genetically modified products contribute to your farming operation and your ability to sustainably produce affordable and safe food?

Thank you, Senator. We rely upon feed crops such as soy and corn products to mix with our grass forages to complete a total mixed ration and meet the nutritional requirements of our cattle, taking into account their needs for milk production, stage of lactation and general body maintenance. Genetically engineered crops ensure affordability for us, non-GMO grain is $555 per ton, versus $305 per ton of conventional (GE) grain. When purchasing 16 tons on average per month, this equates to a $4,000 difference, translating to $48,000 annually. This would wipe away profits, particularly in low milk price years, such as 2015.

Senator Heidi Heitkamp

1. When consumers think of GMOs, they often think of herbicides and pesticides. With the Organic label, they know they're getting non-GMO, non-pesticide food. However, non-GMO foods can be—and are—still grown with conventional methods and sprayed with pesticides. Whether we have a "contains GMO" or "non-GMO" label, either way consumers may think that if they buy the product without GMOs they're buying a product grown without herbicides or pesticides—which is not true and misleading to the consumer. How would we address this, if the goal is to provide more information and not less to consumers?

Great question, Senator Heitkamp, and to illustrate the confusion generated by some marketing tactics regarding certain market labels, you state that with the organic label [consumers] know they're getting non-pesticide food. This isn't true. Organic growing

methods do allow for an approved list of pesticides, which are generally non-synthetic. Conversely, on our farm we don't use any pesticides though our product has no special label. This kind of information – about growing methods and the how's and why's farmers choose to do things the way they do, in my opinion, is best provided in my opinion by farmers themselves. I'm proud to be a part of an initiative called "Ask the Farmers" – a group of farming volunteers from all walks of agriculture committed to sharing their stories and addressing misconceptions. We have a website – askthefarmers.com and we're found across multiple social media mediums. I've also just recently joined the board of directors for a group called the Truth about Trade & Technology and the Global Farmer Network. Here too, is a group whose mission is to put out the farmer voice when it comes to issues and questions about growing food crops and raising livestock. These are just two examples of many other farm and agricultural groups working hard to get their information and message out there. There are many more out there, with individual farmers taking matters into their own hands through blogging websites and again, social media. We need to find a way to amplify these farmers, particularly those who are excited to share just how far we've come in terms of environmental sustainability, productivity, lowering carbon footprints and ensuring livelihood for future generations. Whether this is a q-tag, a television show, educating celebrities, a function of USDA's Agriculture Marketing Service, we can do more for consumers than a few letters on a label.

Senator Patrick Leahy

1. I think we agree that it is not ideal for Vermont to be alone in requiring labeling of GE products, or to have five or 25 states with different standards, but my conclusion is that a national labeling requirement would be the better outcome. Do you agree that the problem you describe with food companies considering not to ship food to the state would be resolved by a national GE labeling standard, whatever that may be?

Thank you, Senator Leahy. I agree that a national solution with regards to GE labeling would resolve the issue of higher food costs and reduced choice to consumers which would

no doubt arise with a patchwork of differing state laws. Given that we can all agree on the safety of these foods made with GE ingredients, I think a national voluntary system modeled after the certified organic program you were integral in creating would meet many specific needs, all the while streamlining and lowering the current costs of non-GMO verification. This would allow folks who still objected to genetic engineering for whatever reason to avoid them while not infringing upon other's access and ability to afford safe food.

Senator John Thune

1. Do you know the approximate percentage of agricultural producers in your home state of Vermont that support the state's mandatory GMO-labeling law?

Thank you, Senator. I cannot pretend to know all or even a majority of ag producers in Vermont. I can say, however, a resolution to repeal Act 120, the mandatory labeling law, was passed unanimously by my home county farm bureau, and then with only two dissenters amongst the voting delegates at the state level. Vermont Farm Bureau is the largest agricultural organization in the state with over 4,000 farm member families. This includes farmers of all sizes and commodities/products - conventional, organic, crop, livestock farmers. Further, 97% of the corn grown for silage in Vermont is from genetically engineered seed, which would indicate that many farmers are comfortable with genetic engineering. I would feel comfortable saying a minority of the ag producers in Vermont support the state's mandatory GMO-labeling law.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
Silver Spring, MD 20993

The Honorable Pat Roberts
Chairman
Committee on Agriculture, Nutrition and Forestry
United States Senate
Washington, D.C. 20510-1605

JAN 12 2016

Dear Mr. Chairman:

Thank you for providing the Food and Drug Administration (FDA or the Agency) with the opportunity to testify at the October 21, 2015, hearing entitled "Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives," before the Committee on Agriculture, Nutrition and Forestry. This letter provides responses for the record to questions posed by Committee Members, which we received on October 29, 2015.

If you have further questions, please let us know.

Sincerely,

Dayle Cristinzio
Acting Associate Commissioner
for Legislation

cc: The Honorable Debbie Stabenow
Ranking Member
Committee on Committee on Agriculture, Nutrition and Forestry

We have restated each Member's questions below in bold, followed by FDA's responses.

Chairman Pat Roberts

1. **During the hearing, I was pleased to hear APHIS, EPA, and FDA testify that the White House Office of Science and Technology Policy (OSTP) review of the Coordinated Framework for the Regulation of Biotechnology will inform their consideration of how to best improve the regulation of plant biotechnology for the future. I understand that each agency's plan will allow the White House review, including public meetings and opportunities for public comments, to inform regulatory considerations. I understand that this theme was also expressed by thirteen farmer, scientific, and seed industry organizations in a letter calling for the White House to carefully consider regulatory policy that will continue to protect health and the environment while not stigmatizing new technologies or unnecessarily impeding innovation. What role will OSTP play in ensuring new regulations that impact the commercialization of new plant varieties are not introduced until the White House review has concluded? What assurances can you offer that the OSTP review process will inform the regulatory agencies' considerations for plant biotechnology?**

   As you know, on July 2, 2015, the Executive Office of the President (EOP) issued a memorandum entitled, "Modernizing the Regulatory System for Biotechnology Products," which directs FDA, the Environmental Protection Agency (EPA), and the U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA/APHIS) to undertake certain specified activities, both in the near term and long term, including:

   1. Updating the 1986 Coordinated Framework for the Regulation of Biotechnology Products (Coordinated Framework) to clarify the current roles and responsibilities of the agencies that regulate the products of biotechnology, after input from the public;

   2. Developing a long-term strategy to ensure the Federal regulatory system is equipped to efficiently assess the risks, if any, associated with future products of biotechnology while supporting innovation, protecting health and the environment, maintaining public confidence in the regulatory process, increasing transparency and predictability, and reducing unnecessary costs and burdens;

   3. Commissioning an external analysis of the future landscape of biotechnology products that will identify: (1) potential new risks and frameworks for risk assessment and (2) areas in which the risks or lack of risks relating to the products of biotechnology are well understood.

   FDA and other agencies have initiated efforts to implement the activities described in the EOP Memorandum, including the following:

   - An inter-agency working group, with representatives from the EOP, EPA, FDA, and USDA, has been established within the Emerging Technologies Interagency Policy

Coordination Committee to implement the activities described in the EOP Memorandum. FDA is a member of this inter-agency working group.

- This interagency working group issued a Request for Information (RFI) in the Federal Register (80 FR 60414, October 6, 2015) to solicit data and information, including case studies, that can inform the development of the proposed update to the Coordinated Framework and the development of a long-term strategy consistent with the objectives described in the EOP Memorandum.

- In addition, on October 30, 2015, at our campus in Silver Spring, Maryland, FDA hosted the first of three public meetings to be held across the country as part of the effort described in the EOP Memorandum. Under the auspices of the National Science and Technology Council, FDA — in conjunction with OSTP, EPA, and USDA — held this meeting to inform the public about the activities described in the EOP Memorandum, invite oral comments from interested parties, and provide information about how to submit comments to the docket.

- As noted in the RFI and the public meeting announcement, information received at and after the public meeting and in response to the RFI will be used by FDA and others in the inter-agency working group as we update the Coordinated Framework and develop the long-term strategy.

FDA will continue to regulate biotechnology products under its existing statutory authorities and regulations, in accordance with the specific legal standards applicable to each type of product under our jurisdiction. In addition, under the Coordinated Framework, FDA will continue to coordinate its regulation of certain products with other agencies, including EPA and USDA.

We note that the Coordinated Framework explains that the existing authorizing statutes provide a basic network of agency jurisdiction over research and products, assuring reasonable safeguards for the public and the environment.

The EOP Memorandum does not affect our existing legal or regulatory standards for evaluation of genetically engineered plants. Rather, we expect the implementation of activities described in the EOP Memorandum will help enhance FDA's existing regulatory processes, including by clarifying FDA's roles and responsibilities for the different biotechnology products as well as the process for inter-agency communication and coordination. To the extent FDA identifies the need for any new regulations or amendments to our existing regulations, we will explore and pursue any such regulatory actions using our rulemaking processes.

FDA is committed to, and looks forward to, working with the EOP, USDA, and EPA to implement the activities described in the EOP Memorandum, consistent with available agency resources and public health priorities. The Agency anticipates that this effort will enhance FDA's existing regulatory processes by increasing transparency and predictability, while providing a framework for assessing innovations in the products of biotechnology.

Senator Debbie Stabenow

1. **If Congress were to direct FDA to design a mandatory genetic engineering disclosure for food products, how would the agency implement this requirement so that the disclosure would be value-neutral about biotechnology and not misleading to consumers about the food safety of the product?**

While is it difficult to answer a hypothetical question such as this with precision, if Congress were to direct FDA to implement a requirement for genetic engineering disclosure for food products, FDA would likely first refer to its final labeling guidance entitled "Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Derived from Genetically Engineered Plants" and examples of statements that may currently be used on products describing the use of genetic engineering. In addition, because the statement would be mandatory, FDA might see the need to engage in consumer research to ensure that any such statement would not be viewed as implying that the food is any different (e.g. more or less safe, nutritionally superior or inferior, or of higher or lower quality) because of the use of biotechnology than foods that do not bear the mandatory statement.

Further, in keeping with the Agency's interpretation of existing statutory requirements, if a particular food from a genetically engineered source is materially different from its non-genetically engineered counterpart, we would require additional labeling to disclose that difference.

Senator Joni Ernst

1. **Is your agency successfully ensuring food derived from biotech crops is safe for humans and animals to consume?**

Yes. We have a rigorous voluntary, premarket consultation program that ensures these foods are meeting the applicable safety and other legal requirements. To our knowledge, all firms planning to market food derived from genetically engineered plants routinely participate in this consultation process prior to market entry. The safety evaluations performed during this process are consistent with international guidelines established by Codex Alimentarius, the food standard-setting body of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO).

Senator Patrick Leahy

1. **At the hearing, I had asked Mr. Gregoire about how USDA was using the laws it had on the books, in this case the Plant Protection Act, to regulate GE crops, even though the law made no mention of GE crops. At the Food and Drug Administration, you have a similar situation where the FDA is using laws pertaining to "Veterinary Drugs" to review the safety, sale, and use of a GE animal, the AquAdvantage Salmon. I have**

heard from many Vermonters upset that the FDA is using the wrong process for evaluating the safety of this modified fish and that the public is being left out. Should Congress enact a new law that more specifically lays out a process to assure the safety of a new GE animal that is intended human consumption?

FDA regulates genetically engineered (GE) animals under the new animal drug provisions of the Food, Drug, and Cosmetic Act (FD&C Act). The FD&C Act defines a drug as "an article (other than food) intended to affect the structure or any function of the body of … animals." A recombinant DNA (rDNA) construct integrated into the DNA of the target animal is intended to affect the structure or function of that animal and therefore meets the definition of an animal drug. As a short hand we sometimes refer to regulation of the article in such GE animals as regulation of the GE animal. Although these provisions may not have been written specifically with GE animals in mind, they require a thorough evaluation of the safety and effectiveness of the regulated article with respect to the animal and, when applicable, the safety to humans and other animals that might eat food derived from the target animal. For these reasons, FDA believes that these provisions are well-suited to assuring the safety and effectiveness of rDNA constructs as integrated into the DNA of GE animals.

In determining whether a new animal drug is safe for humans and other animals to consume, FDA must consider a number of factors including the probable consumption of the drug and of any substance formed in or on food derived from the animal because of the use of the drug, the cumulative effect on man or animal of the drug, and other safety factors. These factors are the same factors that the agency is required to consider when determining whether a proposed food additive is safe (See 21 U.S.C. §§ 348(c)(5) and 360b(d)(2)). Further, when FDA determines the food safety of a new animal drug intended for use in food-producing animals, the Agency applies the same safety standard used to determine whether a food additive is safe for human consumption. Specifically, FDA determines whether there is a reasonable certainty that the substance is not harmful under the intended conditions of use (i.e., there is a reasonable certainty of no harm when the drug is used as intended).

Thus, we believe our existing statutory authority allows FDA to adequately and appropriately regulate GE animals and any food derived from such animals. We do not believe that Congress needs to enact a new law to assure the safety of GE animals for human consumption.

2. **Today, Brazil is the second largest producer of GE soy. The country has had a national requirement since 2004 that requires foods comprised of 1% or more GE components, must present on the product label a triangle on a yellow background with the letter "T" in the center and the expression "contains (name(s)) ingredient(s)) GM(s)." This is a mandatory, national label that simply, in a few words, conveys to consumers that the food contains GE products, but does so without any stigma about GE products. Since that Brazilian legislation was approved, to your knowledge, has there been a reduction in the consumption of GE foods in Brazil or an increase in their consumption?**

FDA does not have data or other information regarding the effect of labeling requirements on consumption of foods produced using genetic engineering in Brazil, and therefore, we are unable to comment.

Senator John Thune

1. **Dr. Mayne, you provide in your testimony that FDA is supportive of voluntary labeling that indicates whether foods have or have not been developed through genetic engineering, provided that such labeling is truthful and not misleading.**
   You also provide in your testimony that, "FDA's voluntary pre-market consultation process provides for a rigorous food safety evaluation of foods derived from genetically engineered plants. As a result of these pre-market consultations, we are confident that foods derived from GE plants in the U.S. marketplace today are as safe as their conventional counterparts."

   If FDA is confident that foods derived from GE plants are just as safe as foods derived from non-GE plants why does FDA also support voluntary labeling?

   Doesn't this send a mixed message to consumers?

   FDA is confident that foods derived from GE plants currently on the market are as safe as foods derived from non-GE plants. However, FDA also recognizes that many consumers are interested in information about the use or non-use of genetic engineering and that some manufacturers want to provide this information on food labels. While FDA cannot mandate the disclosure of such information, we do not oppose the use of voluntary labeling if it is truthful and not misleading. FDA believes the best way to ensure that such labeling is not false or misleading is to provide guidance to industry on how to make such statements. The Agency has published final guidance entitled "Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering" to advise manufacturers about how they might use labeling statements about bioengineering in such a way that is not considered to be false or misleading (80 FR 73194, November 19, 2015). FDA has also published draft guidance on labeling foods derived from genetically engineered Atlantic salmon, currently the only approved genetically engineered animal intended for food use (80 FR 73193, November 19, 2015).

   FDA has in other cases provided guidance on voluntary label statements; for example, "Draft Guidance for Industry and FDA Staff: Whole Grains Label Statements" (71 FR 8597, February 17, 2006). The Agency does not believe that providing guidance for voluntary labeling statements sends mixed messages to consumers about the safety of the product. Rather it assists manufacturers in labeling so that such statements are truthful and not misleading, which is ultimately of benefit to the consumer.

Senate Committee on Agriculture, Nutrition, & Forestry
Agriculture Biotechnology: A Look at Federal Regulation and Stakeholder Perspectives
Wednesday, October 21, 2015
Questions for the Record
Mr. Daryl E. Thomas

Senator Joni Ernst

1. Mr. Thomas, you spoke to the challenges associated with a patchwork of state labeling requirements. What would this translate to in additional costs to your business and to consumers?

Mandatory GMO labeling would impact nearly every aspect of Herr's business, upping costs by requiring increased product inventory, added complexity for packaging and distribution processes, and extensive new regulatory and training requirements.

In order to comply with a patchwork of mandatory state labeling laws, our company would need to change film in mid-production and then keep multiple inventories of the same finished product: one for each state with a mandatory labeling law. Significant lead times and costs also go into a bag design change. We estimate that a bag design change for all 411 of our SKUs could be $5,500 each, equating to a total cost of over $2 million. This extra cost includes plate charges, new film and administrative oversight. To keep a different label for an individual state for all of our SKUs would cost millions of dollars per state.

Like most snack companies, we do not manufacture, distribute, and sell in just one state, which makes complying with a patchwork of state labeling laws such as Vermont's incredibly complex. Quite frankly, these costs could put some companies out of business and thereby increase consolidation in the industry.

A patchwork of mandatory labeling laws would also confuse consumers and add unnecessary costs at the grocery store. Additionally, some food manufacturers may be forced to end the distribution of their products in states that require mandatory GMO labeling, thereby reducing consumer choice. This would have a ripple effect across the distribution chain, impacting drivers, warehouse personnel, account executives, and field management.

Senator Heidi Heitkamp

1. When consumers think of GMOs, they often think of herbicides and pesticides. With the Organic label, they know they're getting non-GMO, non-pesticide food. However, non-GMO foods can be—and are—still grown with conventional methods and sprayed with pesticides. Whether we have a "contains GMO" or "non-GMO" label, either way consumers may think that if they buy the product without GMOs they're buying a product grown without herbicides or pesticides—which is not true and misleading to the consumer. How would we address this, if the goal is to provide more information and not less to consumers?

First, it's important to note that the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA) enforce pesticide tolerances to ensure the safety of the nation's food supply - both organic and conventional. While science has continued to show that GMOs are safe, it's true that misconceptions remain. A patchwork of different labeling rules would add to this confusion. A mandatory GMO label for reasons that are not based on the safety of the ingredients or the material difference of the ingredients would further exacerbate this problem. As I mentioned during the hearing, a mandatory GMO label could be construed to be a "pass/fail" label, even when no material difference has been shown between GMO and non-GMO foods. Establishing a national non-GMO certification process would provide a uniform, government-certified option to those consumers who prefer non-GMO products and thus reduce confusion.

Source: http://www2.epa.gov/pesticide-tolerances/about-pesticide-tolerances

Senator Patrick Leahy

1. Today, 10 states -- California, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon, and Vermont -- all have passed various "bottle bills" that mandate beverage container deposits ranging from 2.5¢ to 15¢ per container, the most common amount being 5¢ per container. While beer and soft drink containers are subject to deposits in all 10 states, only six states require mineral water containers, four states cover malt containers, and three states have wine coolers, liquor, and carbonated mineral water containers. Then there is some variety with other products: Michigan includes containers of canned cocktails, New York includes containers of soda water, and Maine includes containers of juices and tea. In most states, the deposit requirements apply to the full range of container types, including glass, plastic, aluminum, and steel but the State of Delaware, however, has exempted aluminum from its requirement. It seems that beverage companies in this country, from sodas, to beer, and beyond, have been able to follow this "patchwork" of bottle redemption laws. In your testimony, Mr. Thomas, you said that "smaller, family-owned companies such as ours likely will be harder hit by this regulation than large multinational firms." To your knowledge do any smaller, family-owned beverage companies find it cost prohibitive to include a "VT 5¢" on their bottles, as well as a "MI 10¢" on the bottles they sell throughout the 48 contiguous states with a network of brokers, wholesalers, and distributors?
   Whether I buy a soda in Vermont or Kansas, it will have the label on it for these redemption laws. How have these beverage companies been able to do this but a label on a food package for one single state's GE labeling law is impossible?

There are major differences between state bottle redemption laws and mandatory state GMO labeling laws. The indication of a deposit value is simply a statement that if certain conditions are met, the container can be redeemed for a set value in the state(s) on the label. The nature of the information is factual and impartial, while a "*may* contain GMO ingredients" label could be construed as a warning.

The vast majority of distributors do not maintain dual deposit and non-deposit labeled inventory for the affected products because of the high cost associated with producing and warehousing duplicate items. This applies to my industry as well, as the costs associated with separate production and warehousing would be untenable for many snack companies.

There is also a major difference between adding a redemption value to a bottle's label, and changing the label on a packaged snack food. For the vast majority of snack food products, the label is printed as part of the larger bag, a flexible package known in the industry as "film." Changing the label on the food package would involve changing the entire packaging that holds the food, which would incur significant costs. At Herr's we have approximately 411 SKUs, and we estimate that a bag design change for each SKU could be $5,500. This extra cost includes plate charges, new film and administrative oversight. To keep a different label for an individual state for all of our SKUs would cost millions of dollars per state.

2. I believe that both of your companies sell products that contain artificial flavors. For example Mr. Thomas, a number of products in Herr's line contain artificial flavors such as "Honey BBQ Flavored", "Cheddar & Sour Cream", "Baby Back Ribs", and "Sour Cream and Onion", just to name a few. Does the requirement that you include the phrase "artificially flavored" on your packaging have any costs associated the same way you say that a label for GE ingredients will? You are required to put that label on the front of your products, and these are all ingredients that have been proven to be safe. How is the "artificially flavored" label any different from including a label that the food contains safe GE ingredients?

"Artificially flavored" labels are federally regulated as opposed to the state-by-state patchwork of rules that we are currently facing with GMO labeling laws. Additionally, according to the FDA, there are only two reasons why labeling of ingredients should be mandated: 1. To express a material difference of the labeled ingredients, and 2. To alert the consumer of potential risks to human health. Artificial flavorings constitute a material difference, as opposed to the approved use of GMO ingredients, which the FDA and USDA have stated are proven to be safe and are not materially different from their non-GMO counterparts.

3. In the last five years, has Herr's or Stonyfield Yogurt experienced any shifts in the prices of your ingredients that have led your companies to make changes to your ingredients for a particular product? Was that change made to save your company money? What were the costs associated with updating the ingredient panel? Those packaging updates did not make the changes cost prohibitive did they?

Herr's routinely sources its ingredients through different suppliers based on pricing changes, however this does not change the formula of the product, and thus we do not routinely update the ingredients panel of our packages. In fact, Herr's has not undergone product-wide updates to its packaging since the last time the FDA finalized its Nutrition Facts Panel regulations in 1993.

Additionally, according to FDA rules, food companies are not required to update the ingredients panel when changing formulas for cooking oils. An example from a current

ingredients listing taken from a Herr's product: "Choice potatoes cooked in vegetable oil (contains one or more of the following: corn, cottonseed, soybean, sunflower), salt..."

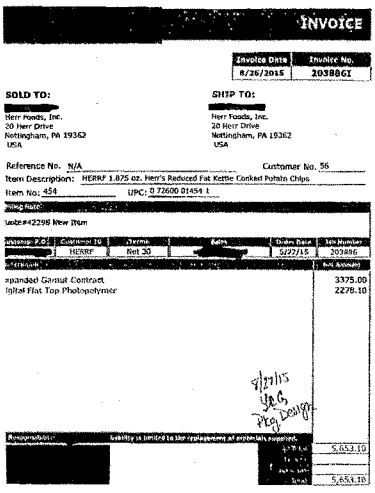
4. In your testimony, you said that the cost for your company for a bag design change "for each SKU is approximately $5,500." However, in the court documents that one of Vermont's largest food companies, Ben & Jerry's, submitted recently related to Vermont's Act 120 labeling law, they said that "the entire process of changing our packaging to comply with Act 120 would cost $500 per SKU." Your testimony is confusing since you mention a bag design change, when the Vermont law requires only a minor change in a label, where adding 4 to 6 words is required, rather than a complete redesign. Can you help me understand why the cost you listed in testimony before this Committee makes it appear that it would cost you $5,500 to comply with Vermont's Act 120, when other companies are saying the cost would be $500, just 9 percent of the cost you listed in your testimony?

While I cannot speak to the specific costs that other companies face, there is a major difference between the packaging for other food products compared to snacks. Our products are packaged in flexible packaging, which we term "film," and depending on the requirements for a mandatory label, it may not be possible to modify the label without changing the entire package makeup for an individual product. Please refer to the attached copies of invoices from our packaging suppliers that illustrate the high costs of making changes to our packaging for a single product.

In order to comply with a patchwork of mandatory state labeling laws, our company would need to change film in mid-production, resulting in significant lost production time, and then keep multiple inventories of the same finished product: one for each state with a mandatory labeling law. Significant lead times and costs also go into a bag design change. We estimate that a bag design change for all 411 of our SKUs could be $5,500 each, equating to a total cost of over $2 million. This extra cost includes plate charges, new film and administrative oversight. To keep a different label for an individual state for all of our SKUs would cost millions of dollars per state.

Additionally, the process of designing, compliance review, plate making, and lead-time for film would be 20-26 weeks each time a new label was required. The actual cost of the run after converting the film could be approximately 25 percent higher due to the shorter production runs of product that would be required to fulfill orders in Vermont, for example.

The additional challenge exists of meeting print minimums from our packaging suppliers. If the amount of film required to be printed (in this case, a different film for Vermont), does not meet a minimum threshold, our packaging suppliers may opt to not supply the film for that particular product due to their own production requirements and cost minimums.



INVOICE

Invoice Date	Invoice No.
8/26/2015	203886I

SOLD TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

SHIP TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

Reference No. N/A Customer No. 56
Item Description: HERRF 1.875 oz. Herr's Reduced Fat Kettle Cooked Potato Chips
Item No: 454 UPC: 0 72600 01454 1

Billing Note:
ote#42298 New Item

Customer P.O.	Customer ID	Terms	Sales	Order Date	Job Number
[redacted]	HERRF	Net 30	[redacted]	8/27/15	203886

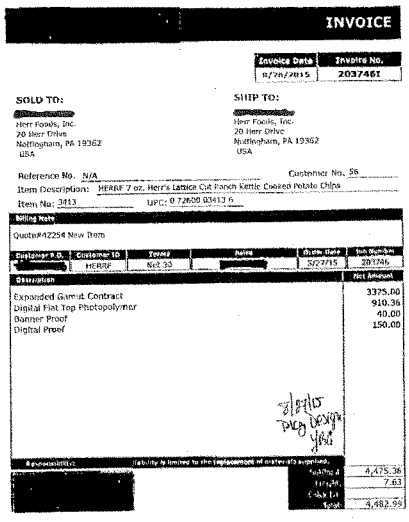
Description	Net Amount
xpanded Gamut Contract	3375.00
igital Flat Top Photopolymer	2278.10

8/27/15 Proj Design Yes

Responsibility: [redacted] Liability is limited to the replacement of materials supplied.

Subtotal	5,653.10
Freight	
Sales Tax	
Total	5,653.10

THANK YOU FOR YOUR BUSINESS AND YOUR CONSIDERATION



INVOICE

Invoice Date	Invoice No.
8/26/2015	203746I

SOLD TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

SHIP TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

Reference No. N/A Customer No. 56
Item Description: HERRF 7 oz. Herr's Lattice Cut Ranch Kettle Cooked Potato Chips
Item No: 3813 UPC: 0 72600 03813 6

Billing Note:
Quote#42254 New Item

Customer P.O.	Customer ID	Terms	Sales	Order Date	Job Number
[redacted]	HERRF	Net 30	[redacted]	8/27/15	203746

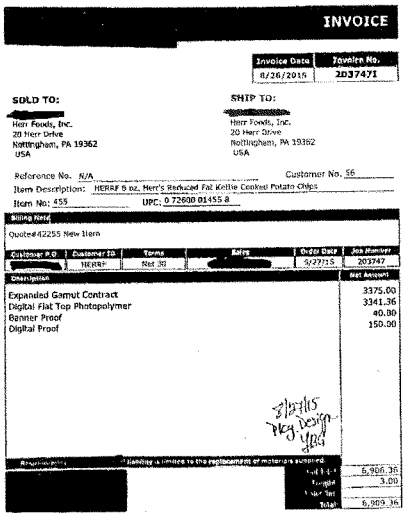
Description	Net Amount
Expanded Gamut Contract	3375.00
Digital Flat Top Photopolymer	910.36
Banner Proof	40.00
Digital Proof	150.00

8/27/15 Proj Design Yes

Responsibility: [redacted] Liability is limited to the replacement of materials supplied.

Subtotal	4,475.36
Freight	7.63
Sales Tax	
Total	4,482.99

THANK YOU FOR YOUR BUSINESS AND YOUR CONSIDERATION



INVOICE

Invoice Date	Invoice No.
8/26/2015	203747I

SOLD TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

SHIP TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

Reference No. N/A Customer No. 56
Item Description: HERRF 6 oz. Herr's Reduced Fat Kettle Cooked Potato Chips
Item No: 455 UPC: 0 72600 01455 8

Billing Note:
Quote#42255 New Item

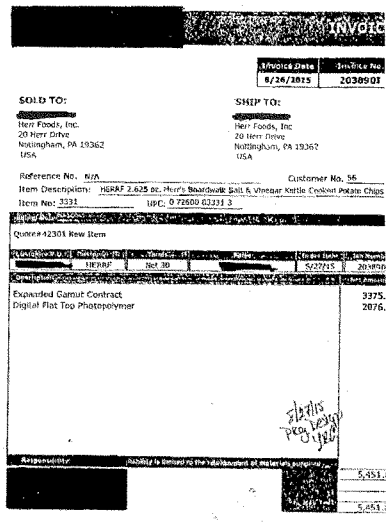
Customer P.O.	Customer ID	Terms	Sales	Order Date	Job Number
[redacted]	HERRF	Net 30	[redacted]	8/27/15	203747

Description	Net Amount
Expanded Gamut Contract	3375.00
Digital Flat Top Photopolymer	3341.36
Banner Proof	40.00
Digital Proof	150.00

8/27/15 Proj Design Yes

Responsibility: [redacted] Liability is limited to the replacement of materials supplied.

Subtotal	6,906.36
Freight	3.00
Sales Tax	
Total	6,909.36



INVOIC

Invoice Date	Invoice No.
8/26/2015	203690I

SOLD TO:
[redacted]
Herr Foods, Inc.
20 Herr Drive
Nottingham, PA 19362
USA

SHIP TO:
[redacted]
Herr Foods, Inc
20 Herr Drive
Nottingham, PA 19362
USA

Reference No. N/A Customer No. 56
Item Description: HERRF 2.625 oz. Herr's Boardwalk Salt & Vinegar Kettle Cooked Potato Chips
Item No: 3331 UPC: 0 72600 03331 3

Billing Note:
Quote#42301 New Item

Customer P.O.	Customer ID	Terms	Sales	Order Date	Job Number
[redacted]	HERRF	Net 30	[redacted]	8/27/15	203690

Description	Net Amount
Expanded Gamut Contract	3375.
Digital Flat Top Photopolymer	2076.

8/27/15 Proj Design Yes

Responsibility: [redacted] Liability is limited to the replacement of materials supplied.

Subtotal	5,451.
Freight	
Sales Tax	
Total	5,451.

Senator John Thune

1. Would it be economically feasible for your company to invest in the infrastructure needed to produce a separate GMO free line of products?
   Is there currently enough demand to justify this expense?

Herr's supports consumers having options in the marketplace. In fact, we have recently introduced a Non-GMO Project Verified popcorn to our product lineup. The introduction of this product was supported by demand in the marketplace. We believe there is sufficient consumer demand at the right price point to support our non-GMO popcorn product. For other products in our portfolio, it is unclear if the market demand is there to justify a non-GMO product line, so we have made the business decision not to undergo a similar process for other products at this time. As I mentioned in my testimony, there are considerable costs involved with segregating GMO and non-GMO products throughout the supply chain. That said, other companies with different business models do provide non-GMO alternatives for potato chips, tortilla chips, pretzels and even cheese curls. Each company must determine what the right business model is for their production methods and their marketing area.

2. What if GMO labeling was to become mandatory in your state, or nationwide – do you think that would change the demand and make it feasible to expand your business to produce GMO-free products?

It is my belief that the current market is already working to adjust to the increasing demand among consumers for non-GMO products. An increasing number of businesses are satisfying that demand. If GMO labeling was mandated, this could place an unnecessary stigma on products that contain FDA-approved GMO ingredients and cause undue alarm and confusion among consumers. The indirect effect of this could be an increase in price of an already-limited and costly supply of non-GMO ingredients. Those costs would be passed down to the consumer. While we currently do produce non-GMO snacks as noted in your first question, I do not foresee that it would be feasible to expand our business to make entirely non-GMO products. A major problem would be commodity sourcing. Over 80% of the soybeans, corn and cotton are genetically engineered, according to the USDA.

Source: United States Department of Agriculture Economic Research Service. "Recent Trends in GE Adoption". July 14, 2014. Retrieved from: http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx

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