

# TITLE VII RESEARCH

# SUMMARY OF RESEARCH TITLE REFORM

## *Recommendations In Brief*

Reorganize and revitalize USDA's research, education, and economics mission and increase investment in high priority areas of research such as specialty crops, bio-energy, and bio-based products.

## *Problem*

The agriculture industry faces unique challenges in the 21<sup>st</sup> Century. Many of these challenges can only be met through technological advancements driven by high quality agricultural research. While agricultural technology and scientific advancements have been astounding, more should be done to maintain U.S. agriculture's competitive edge.

When talking about the importance of agricultural research, David, from Indiana, said during a USDA Farm Bill Forum, "...we get the highest return on investment on those dollars as about any money that's going to be spent in the farm bill. And that allows us to be low-cost producers of a safe and reliable food and fiber source." And Sara, from Delaware, said, "It's imperative that the next farm bill will provide support for continuing research and education. The future of American agriculture will depend on it. Technological advances in agriculture will help the next generation of American farmers."

One area of particular challenge to agricultural researchers is our nation's dependence on foreign oil. Sixty percent of the petroleum used in the United States is now imported. If farm-raised biofuels and biobased products are to displace a significant portion of the foreign energy sources, conversion efficiency of biomass must be advanced, and top quality research must meet the challenge.

Additionally, specialty crops producers face unique challenges that require technological advancement. Specialty crops are now equal in value to program crops and yet specialty crops producers receive no direct cash assistance from the farm bill. This fact strengthens the case for significant investment in specialty crops research.

USDA's agricultural research structure needs to be updated and streamlined to meet the challenges associated with agriculture in the 21<sup>st</sup> Century. USDA has two separate agencies overseeing agricultural science with each entity maintaining separate national program staff. This situation leads to redundancy, higher administrative costs, lack of coordination, and an inability to maximize resources. One USDA Farm Bill Forum participant asked, "Is anyone really coordinating the USDA's research funding strategy?" USDA's research title proposals would strengthen coordination, efficiency, and the focus on priorities.

### ***Recommended Solution***

The Administration is recommending several reforms and new initiatives for Title VII of the farm bill – entitled “Research and Related Matters.” Following is a list of the major components of the package.

1. Consolidate USDA’s Agricultural Research Service (ARS) and the Cooperative State Research, Education, and Extension Service (CSREES) into a single agency named the Research, Education, and Extension Service (REES), which will coordinate both intramural and extramural research, extension, and education programs. (For further information, see the proposal entitled “Research, Education And Economics (REE) Mission Area Reorganization” on pages 127–128.)
2. Rename the Research, Education, and Economics (REE) mission area the Office of Science. (For further information, see the proposal entitled “Research, Education And Economics (REE) Mission Area Reorganization” on pages 127 – 128.)
3. Establish an annual \$50 million Agricultural Bio-Energy and Bio-Based Products Research Initiative to advance fundamental scientific knowledge for the improved production of renewable fuels and bio-based products. (For further information, see the proposal entitled “Agricultural Bio-Energy and Bio-Based Products Research Initiative” on pages 129 – 130.)
4. Establish an annual \$100 million Specialty Crop Research Initiative to provide science-based tools for the specialty crop industry. (For further information, see the proposal entitled “Specialty Crop Research Initiative” on pages 131 – 132.)
5. Authorize USDA to conduct research and diagnostics for highly infectious foreign animal diseases on mainland locations in the U.S. (For further information, see the proposal entitled “Foreign Animal Disease Research” on page 133.)
6. Invest an additional \$10 million in mandatory funding to be available until expended for organic research. This new funding would focus on conservation and environmental outcomes and new and improved seed varieties especially suited for organic agriculture. (For further information, see the proposal entitled “Organic Farming Initiatives” on pages 166 – 167.)

# **RESEARCH, EDUCATION AND ECONOMICS (REE) MISSION AREA REORGANIZATION**

## ***Recommendation In Brief***

Consolidate USDA's Agricultural Research Service (ARS) and the Cooperative State Research, Education, and Extension Service (CSREES) into a single agency named the Research, Education, and Extension Service (REES), which will coordinate both intramural and extramural research, extension, and education programs. Rename the Research, Education, and Economics (REE) mission area the Office of Science.

## ***Problem***

USDA currently has two separate agencies responsible for agricultural science. CSREES supports extramural programs (external of USDA), while ARS conducts intramural research (internal to USDA). Both agencies support basic and applied research spanning the full spectrum of agriculture related issues including plant and animal systems, food and nutrition, and natural resources. Each agency maintains a separate National Program Staff (NPS) to manage programs and resources across these areas, leading to redundancy and administrative costs that could instead be invested in research and education.

Consolidating agency administrations will ensure that USDA's intramural and extramural science programs are well-coordinated and are maximizing resources. In addition, consolidation of the two agencies will ensure USDA's research arm is able to respond to emerging issues and address some of the most critical issues facing agriculture.

Additionally, the current structure can be confusing to USDA partners and stakeholders. Concern regarding this issue was raised during the Farm Bill Forums. For example, Eugene from Iowa raised the following concern: "The Department's dual research structure ARS/Land Grant Universities has strengths and weaknesses but the intellectual and political challenges it faces have never been more numerous or challenging....Is anyone really coordinating the USDA's research funding strategy?" And Steve, from California, expressed the need for "greater coordination of research between government and colleges."

The Land Grant Universities have also called for more coordination of USDA's research programs. This is reflected in their Creating Research, Extension and Teaching for the 21<sup>st</sup> Century (CREATE-21) proposal, which advocates a consolidation of USDA's research agencies.

## ***Recommended Solution***

The Administration proposes the creation of the Research, Education and Extension Service (REES) through the merger of ARS and CSREES. This new agency would be under the leadership of a Chief Scientist. This person would have authority for REES program offices, program implementation, and administrative and resource management.

We propose retaining authorities for the 1890, 1994 and Hispanic Serving Institutions. However, a new consolidated authorization would be sought to support the overall REES program. Funding under this consolidated line item would be under the authority of the REES Chief Scientist and support both intramural and extramural activities. The REES Chief Scientist, in concurrence with the Office of Science Under Secretary, would have administrative responsibility for allocation of funds.

This integration of programs will provide better coordination and allow for enhanced efficiency and effectiveness of program implementation and resource allocation. Duplication of efforts between intramural and extramural programs would be minimized, while better identifying and utilizing the comparative strengths of USDA's in-house capacity as well as USDA's university partners and other stakeholders.

Additionally, the REE mission area would be renamed the Office of Science. Leadership would continue through the Under Secretary and Deputy Under Secretary. This name change is consistent with several other federal government departments and better identifies the mission area as the one-stop scientific resource for agriculture.

### ***Background***

USDA's research, extension, and education programs are concentrated within the Research, Education and Economics (REE) mission area. REE consists of the Agricultural Research Service (ARS), the Cooperative State Research, Education and Extension Service (CSREES), the Economic Research Service (ERS), and the National Agricultural Statistics Service (NASS). Through these agencies, REE supports basic and applied research, economics, and statistics, as well as higher education and outreach.

ARS is the USDA's chief scientific intramural research agency and operates 107 research locations across the country. CSREES has the primary responsibility within USDA to provide extramural research, education, and extension conducted in partnership with state Land Grant Universities (LGUs) and other institutions throughout the country. ERS is a main source of economic research and information for USDA and NASS is the primary USDA statistical agency.

# **AGRICULTURAL BIOENERGY AND BIOBASED PRODUCTS RESEARCH INITIATIVE**

## ***Recommendation In Brief***

Establish an Agricultural Bioenergy and Biobased Products Research Initiative with \$500 million over 10 years to advance fundamental scientific knowledge for the improved production of renewable fuels and biobased products.

## ***Problem***

At present, 60 percent of the petroleum used in the U.S. is imported, primarily from countries in unstable parts of the world. The nation's dependence on these imports poses a threat to our national economy and security. Ethanol and related products produced from agricultural feedstocks (biomass) are beginning to be utilized instead of petroleum as energy and as components of carbon-based products such as plastics and fabrics. Additional research and development on biobased products are needed to advance these alternatives to petroleum-based products, as well as help meet the goals set forward in USDA's BioPreferred Program.

In order to meet the Nation's growing energy demands, production capacity and conversion efficiency of biomass must be improved. Increased support for bioenergy research and development was repeatedly raised as an important issue during Farm Bill Forums across the country. For example, Jocie from North Dakota stated, "More research is needed on increased efficiency of bio-fuels, the development of biobased products, and effective ways to integrate producers and rural communities in the development of biobased businesses." While Duane in Iowa said, "In regard to the 2007 farm bill, we believe that renewable energy should be a focal point. The current energy title should be strengthened." And Allan from Florida advocated "support for a competitive research program for fuels, chemicals and energy from biomass."

## ***Recommended Solution***

The Administration proposes the creation of the Agricultural Bioenergy and Biobased Products Research Initiative to enhance the production and conversion of biomass to renewable fuels and related products. Approximately \$50 million of annual mandatory funding will support a USDA bioenergy and biobased product laboratory network utilizing existing USDA research facilities as well as engaging universities through a competitive process and connecting them to the laboratory network.

The new initiative will focus research and development efforts on two objectives: 1) improving biomass production and sustainability and 2) improving biomass conversion in biorefineries. This proposal will accomplish the following --

1. Leverage the Department's existing broad scientific capabilities in plant genetics and breeding; crop production; soil and water science; agricultural waste utilization; carbohydrate, lipid, protein, and lignin chemistry and biochemistry; enzyme development; fermentation; and microbiology.

2. Support new bioenergy and biobased product research that will help achieve the goals of the Advanced Energy Initiative and the BioPreferred Program.
3. Identify leading universities in bio-energy and biobased products research and capitalize on the respective strengths of USDA, DOE and the university community.

These three components will take full advantage of the USDA's internal and external research programs together with the network of extensive knowledge and capabilities that reside within the Land Grant universities and other research institutions throughout the U.S. At the same time, these activities will be closely coordinated with the Department of Energy (DOE), and its national labs and centers of excellence to ensure that there is no duplication of effort and that each organization's respective strengths are maximized.

### ***Background***

The production of bio-energy and biobased products from the Nation's agricultural resources presents a significant opportunity to reduce our dependency on foreign oil, enhance our economy, improve our environmental quality, and increase our nation's energy security. Fuel ethanol and biodiesel production from corn starch and soybean oil respectively comprised approximately 2.2 percent of U.S. liquid transportation fuel use in 2005, and that percentage will increase in 2006. The number of ethanol and biodiesel plants also continues to grow.

In order to meet the growing demand for biofuels, new varieties of starch and oil-based crops that will grow abundantly nationwide will be needed. New methods must be developed to convert agricultural waste materials such as corn stover and wood chips to produce enough biofuels and other combustible bioenergy products to increase our use of renewable resources and decrease our Nation's dependence on foreign oil. Additionally, significant economic opportunities exist to produce a wide range of industrial products from the byproducts of bioenergy production. To further develop these industrial products, an intense, broad-based research effort is needed.

Research conducted and/or funded by the USDA has already led to significant advances in technology that make agricultural biomass a viable alternative to petroleum. However, as the President outlined in his Advanced Energy Initiative and at the recent renewable energy conference hosted by USDA and DOE, there is a need for more research on bioenergy.

# **SPECIALTY CROP RESEARCH INITIATIVE**

## ***Recommendation In Brief***

Invest \$1 billion over ten years to establish a Specialty Crop Research Initiative to provide science-based tools for the specialty crop industry.

## ***Problem***

Enhanced research, extension, and education programs are needed to help the specialty crop industry address these challenges. The USDA's National Agricultural Research, Extension, Education, and Economics Advisory Board (NAREEEAB) recently recognized this need in their report on specialty crops.

During the Farm Bill Forums, many specialty crop producers spoke about the inequities in the current system and the need for greater investment in research. For example, Charles, from Georgia, noted that "federal investment in agricultural research dedicated to the economic vitality and long-term viability of United States specialty crops has been extremely limited....Federal investments in research for specialty crop production, processing, marketing and consumption which influence public access to these vital commodities must be re-emphasized in the next farm bill."

And Tom, at the California forum, stated: "Specialty crops are vital to the health and well-being of all Americans, and increased consumption of specialty crops will provide tremendous health and economic benefits to both consumers and growers....The next farm bill must address specialty crop issues much more effectively than in the past farm bills....Policy areas that the next farm bill must address, with respect to the unique needs of specialty crop growers, include the following: specialty crop block grants, international trade, nutrition, marketing, invasive pest and disease issues, research, competitive grants, and conservation programs."

## ***Recommended Solution***

The Administration proposes investing \$100 million in annual mandatory spending to create a new Specialty Crop Research Initiative to address the critical needs of the specialty crop industry. The initiative will support both intramural and extramural programs across the nation and provide science-based tools to address needs of specific crops and regions. Focus areas will include:

1. Conducting fundamental work in plant breeding, genetics, and genomics to improve crop characteristics such as product appearance, environmental responses and tolerances, nutrient management, pest and disease management, enhanced phytonutrient content, as well as safety, quality, yield, taste, and shelf life.
2. Continuing efforts to identify threats from invasive species such as Citrus Greening and Glassy-Winged Sharpshooter.
3. Optimizing production by developing more technologically efficient and effective application of water, nutrients, and pesticides to reduce energy use and improve production efficiency.



4. Developing new innovations and technology to enhance mechanization thus reducing reliance on labor.
5. Improving production efficiency, productivity, and profitability over the long term.

### ***Background***

The U.S. specialty crop industry is comprised of producers and handlers of fruits, tree nuts, vegetables, melons, potatoes, and nursery crops, including floriculture. It is a major contributor to the U.S. agricultural economy. Specialty crops accounted for 10 million harvested cropland acres in 2004. The value of total U.S. specialty crops (\$49 billion in sales) now exceeds the combined value of the five major program crops (\$45.8 billion in sales).

One of the principle opportunities to enable the specialty crop industry to remain competitive in the global environment and to continue contributing to the U.S. economy is to support research programs that facilitate continued advancements in productivity and technology.

# **FOREIGN ANIMAL DISEASE RESEARCH**

## ***Recommendation In Brief***

Authorize USDA to conduct research and diagnostics for highly infectious foreign animal diseases on mainland locations in the U.S.

## ***Problem***

Research and diagnostics for highly infectious foreign animal disease agents, such as Foot and Mouth Disease (FMD) and Rinderpest viruses, are currently confined to an off shore location, presently the Plum Island Animal Disease Center (PIADC). The Department of Homeland Security (DHS) has initiated a process to move all the functions of PIADC to a new facility to be named the National Bio and Agro-Defense Facility (NBAF). When the new DHS NBAF facility is constructed and operational, all USDA work at Plum Island is expected to relocate to this new mainland facility. In anticipation that this facility will be built on the U.S. mainland, USDA must be authorized to conduct important foreign animal disease research on FMD and other select diseases at the new facility or at other U.S. locations equipped to handle highly infectious diseases.

Research, diagnostics and training, as well as vaccine development and evaluation are critical components to fighting and mitigating the effects of these diseases and securing the U.S. food and agricultural system. Without this research, U.S. farmers and our entire food system would be at greater risk.

## ***Recommended Solution***

The Administration proposes specific authorization for USDA to conduct research and diagnostics for highly infectious disease agents, such as FMD and Rinderpest on the U.S. mainland.

## ***Background***

Research and diagnostics for highly infectious foreign animal disease agents, such as FMD and Rinderpest viruses, are statutorily confined to an off shore location, i.e. the PIADC. In 1990, the original 1884 statute was amended, 21 U.S.C. 113a, to authorize the Secretary of Agriculture to issue a permit for FMD live virus work on the U.S. mainland when necessary and in the public interest.

Today, modern biocontainment facility construction and rigorous biosafety operational standards allow such work to be safely done without fear of virus escape to the environment or harm to animal and/or public health.