



**Hearing Memorandum**  
September 23, 2015

**To:** Members of the House Committee on Agriculture Subcommittee on Biotechnology, Horticulture and Research  
**From:** Committee Staff  
**Subject:** Research Innovations through Our Nation's Agricultural Colleges and Universities  
**Date/Time:** Tuesday, September 29, 2015, 10:00 a.m.  
**Location:** 1300 LHOB

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The House Committee on Agriculture will convene a Subcommittee hearing on Tuesday, September 29, 2015 at 10:00 a.m. to review research innovations achieved by our nation's agricultural colleges and universities. If you have any questions, please feel free to contact Mary Nowak at 5-3356 or John Goldberg at 5-4980.

**Witness List**

- Dr. Robert J. Houser, Dean of the College of Agricultural, Consumer and Environmental Science, University of Illinois, Urbana, IL
- Dr. James W Moyer, Associate Dean for Research, College of Agricultural, Human, and Natural Resource Sciences, Washington State University, Pullman, WA
- Dr. Mindy Brashears, Director of the International Center for Food Industry Excellence, Texas Tech University, Lubbock, TX
- Dr. Michael Heithaus, Associate Dean, College of Arts and Sciences, Florida International University, North Miami FL
- Dr. Michael P. Lacy, Professor and Department Head, Department of Poultry Science, University of Georgia, Athens, GA
- Dr. Douglas D. Buhler, Senior Associate Dean for Research, College of Agriculture and Natural Resources, Michigan State University, East Lansing, MI

**Focus of the Hearing**

This hearing will allow for Members to learn about innovative agricultural research being done at our nation's agricultural colleges and universities, in which many of these projects are funded through federal research programs. Witnesses are also prepared to discuss the policy challenges facing the research community, such as extension and outreach, mechanisms to leverage federal resources, cooperation between the various institutions, and other issues of importance to the community.

## **USDA's Role in Research**

The USDA is responsible for conducting agricultural research at the federal level. There are four divisions of USDA's Research, Education and Economics (REE) mission area. The USDA-REE agencies provide federal leadership in creating and disseminating knowledge spanning across the biological, physical, and social sciences related to agricultural research, economic analysis, statistics, extension, and higher education. They include the Agricultural Research Service, the Economic Research Service, the National Agricultural Statistics Service, and the National Institute of Food and Agriculture. Appropriations for the agricultural research, education, and extension of the USDA have remained relatively flat, when adjusting for inflation, since the 1970s.

### **The Agricultural Research Service (ARS)**

The Agricultural Research Service is USDA's in-house basic and applied research agency. ARS laboratories focus on efficient food and fiber production, development of new products and uses for agricultural commodities, development of effective controls for pest management, and support of USDA regulatory and technical assistance programs. ARS also operates the National Agricultural Library, one of the Department's primary information repositories for food, agriculture, and natural resource sciences.

ARS is the USDA's chief scientific research arm. ARS conducts research to develop and transfer solutions to agricultural problems of high national priority including: New products/product quality value added; Livestock production; Crop production; Food safety; Livestock protection; Crop protection; Human nutrition; and Environmental stewardship.

To see a map of ARS research locations, follow [this link](#).

### **The Economic Research Service (ERS)**

The Economic Research Service produces analysis of economic and social science information on agriculture, rural development, food, commodity markets, and the environment. It compiles and disseminates data concerning USDA programs and policies to various stakeholders.

### **The National Agricultural Statistics Service (NASS)**

The National Agricultural Statistics Service conducts the Census of Agriculture and provides official statistics on agricultural production and indicators of the economic and environmental status of the farm sector. NASS data is an integral part of the objective information supporting commodity markets for buyers and sellers, and informing producer groups, agribusinesses, economists, and policy makers.

### **National Institute of Food and Agriculture (NIFA)**

NIFA is the agency that channels a portion of the annual USDA appropriations to states and US territories to support higher education in agriculture, state and regional research, and continuing agricultural education and outreach to the public.

NIFA's unique mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education, and extension

programs in the Land-Grant University System and other partner organizations. NIFA doesn't perform actual research, education, and extension but rather helps fund it at the state and local level and provides program leadership in these areas. NIFA's two key mechanisms for accomplishing its mission of "advancing knowledge" are: 1) National program leadership to help states identify and meet research, extension, and education priorities in areas of public concern that affect agricultural producers, small business owners, youth and families, and others; and 2) Federal assistance to provide annual formula funding to land-grant universities and competitively granted funds to researchers in land-grant and other universities.

## **Funding**

The primary and longest-standing mechanisms for distributing the annual appropriation for cooperative research and extension to the college of agriculture at each state's land grant university are the Hatch Act and Smith-Lever Act formulas (see Formula Funds below). Additional funding for cooperative state research comes from state appropriations, competitive grants from USDA and other federal agencies, and private industry.

Agricultural research, education, and extension at the federal and state levels are supported through a combination of direct appropriations (to ARS, ERS, and NASS) and block grants to states, competitive grants, and congressionally designated grants (all administered by NIFA). While it is acknowledged that these funding mechanisms have served agriculture well, the scientific community has argued that more USDA research funding should be distributed through the competitive, peer-reviewed grant process. The National Academy of Sciences (NAS) maintains that a larger pool of scientists and new research in priority areas are stimulated by the competitive grants process. However, recent proposals by administration to direct grants toward the competitive process from block-grant funded programs have drawn criticism from colleges of agriculture in the states, and Congress has not adopted them.

### **Formula Funds**

Federal funding for research at the state agricultural experiment stations is authorized under the Hatch Act of 1887, which Congress amended in 1955 to include a formula that distributes the federal appropriation among states based on each state's farm and rural population. The Hatch Act, as amended, also requires dollar-for-dollar matching funds from state appropriations; however, most states appropriate three to four times the federal allotment.

Another provision in the act, as amended by the Agricultural Research, Extension, and Education Reform Act of 1998, requires each state to use 25% of its Hatch Act funds to support multi-state or regional research. Congress reauthorized the higher percentage through each subsequent farm bill.

Using a census-based formula to calculate the annual distribution of research funds to each state has meant that the state allocations have been quite constant from year to year, since annual appropriations have remained at the same level or increased slightly. Although all federal sources account for 30% or less of total funding for the experiment stations (including grants from non-research agencies within USDA and from other federal departments), the reliability of the formula funds have resulted in their traditionally being used to support the core ongoing research programs of the state agricultural experiment stations. The latter, in

turn, underpin the universities' academic programs. Formula funds are similar to block grants, and the scope and content of the programs they support are under the control of the research deans at the colleges of agriculture.

Federal funding for cooperative extension in the states is distributed under a formula (similar to the Hatch Act formula and census-based) in the Smith-Lever Act of 1914, as amended. State appropriations generally exceed the 100% matching funds requirement. Federal funding supporting forestry and veterinary programs at the land grant institutions also is distributed among the institutions according to formulas, but these have different criteria than the Hatch Act and Smith-Lever Act formulas.

#### The Agriculture and Food Research Initiative (AFRI)

AFRI, originally two separate programs, the National Research Initiative and the Initiative for Future Food and Agricultural Systems (IFAFS) was established in 2008 as a five-year, \$700 million competitive grants program supported by appropriated funds. AFRI combines both fundamental and applied research grants distributed over 6 main priority areas: Plant health and production and plant products; Animal health and production and animal products; Food safety, nutrition, and health; Bioenergy, natural resources, and environment; Agriculture systems and technology; and Agriculture economics and rural communities. To the maximum extent practicable, NIFA, makes grants for high priority research, education, and extension, taking into consideration, when available, the determinations made by the National Agricultural Research, Extension, Education, and Economics Advisory Board.

#### Specialty Crop Research Initiative (SCRI)

The purpose of the SCRI program is to address the critical needs of the specialty crop industry by awarding grants to support research and extension that address key challenges of national, regional, and multi-state importance in sustaining all components of food and agriculture, including conventional and organic food production systems. Projects must address at least one of five focus areas: 1) research in plant breeding, genetics, genomics, and other methods to improve crop characteristics; 2) efforts to identify and address threats from pests and diseases, including threats to specialty crop pollinators; 3) efforts to improve production efficiency, handling and processing, productivity, and profitability over the long term (including specialty crop policy and marketing); 4) new innovations and technology, including improved mechanization and technologies that delay or inhibit ripening; or 5) methods to prevent, detect, monitor, control, and respond to potential food safety hazards in the production efficiency, handling and processing of specialty crops. Estimated total program funding for the current fiscal year is \$49M.

#### Specialty Crop Research Initiative/Citrus Disease Research and Extension (SCRI/CDRE)

The Specialty Crop Research Initiative (SCRI) Citrus Disease Research and Extension Program (CDRE) is authorized in the Agricultural Act of 2014 to award grants to eligible entities to conduct research and extension activities, technical assistance and development activities to: (a) combat citrus diseases and pests, both domestic and invasive and including huanglongbing and the Asian citrus psyllid, which pose imminent harm to United States citrus production and threaten the future viability of the citrus industry; and (b) provide support for the dissemination and commercialization of relevant information, techniques, and technologies discovered pursuant to research and extension activities funded through

SCRI/CDRE and other research and extension projects targeting problems caused by citrus production diseases and invasive pests. Estimated total program funding for the current fiscal year is \$23M.

### Other Competitive Grants

The National Science Foundation (NSF) and the National Institutes of Health (NIH), the government's two largest science agencies, award the majority of their appropriations through competitive grants to scientists across a variety of the nation's research venues. In 1989 when the National Academy of Sciences (NAS) first recommended that 35% total USDA research money be distributed competitively, less than 6% was. According to CRS, 14% of FY 2006 appropriations were dispersed in this way.

### Centers of Excellence

The Farm Bill requires that NIFA recognize centers of excellence in research, extension, and education in the food and agricultural sciences. The legislation calls for the agency to give priority in funding to applications from centers of excellence in its research and extension competitive grant programs.

To implement this provision, in fiscal years 2015 and 2016, NIFA allows eligible applicants to request consideration for Centers of Excellence (COE) designation as part of their grant applications. Requests for applications describe the criteria applicants must meet.

### Matching Requirement

The Agricultural Act of 2014 added a new requirement for financial matching of some NIFA competitive grant awards.

Matching for these awards means that a grantee must provide funds, in-kind contributions, or a combination of both, from sources other than funds provided through such grant in an amount that is at least equal to the amount awarded by NIFA, unless the grantee is exempt from the matching requirement or the requirement is waived.

The matching requirement only applies to new awards made on or after October 1, 2014. It does not supersede matching requirements that were in place for competitive grant awards made before October 1, 2014 and only applies to competitive grants made under covered programs.

Entities that are exempt from the new matching requirement as specified in the Farm Bill can be found [here](#).

### Commodity Boards

The 2014 Farm Bill allows eligible national and state commodity boards to propose topics for research that they are willing to equally co-fund with NIFA. Eligible commodity boards must address an agricultural commodity as well as: include a combination of promotion, research, industry information, or consumer information activities; be funded by mandatory assessments on producers or processors; and be designed to maintain or expand markets and uses for the commodity (as determined by the Secretary of Agriculture). Proposed topics must relate to the established priority areas of the Agriculture and Food Research Initiative Competitive Grants

Program (AFRI) to be considered for inclusion in future AFRI Requests for Applications (RFAs). The established AFRI priority areas, are plant health and production and plant products; animal health and production and animal products; food safety, nutrition, and health; renewable energy, natural resources, and environment; agriculture systems and technology; and agriculture economics and rural communities.

### **Agricultural Colleges and Universities**

#### **1862 Morrill Act**

Under the act, each eligible state received a total of 30,000 acres of federal land, either within or contiguous to its boundaries, for each member of congress the state had as of the census of 1860. This land, or the proceeds from its sale, was to be used toward establishing and funding the educational institutions “without excluding other scientific and classical studies and including military tactic, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.” Under provision six of the Act, "No State while in a condition of rebellion or insurrection against the government of the United States shall be entitled to the benefit of this act," in reference to the recent secession of several Southern states and the currently raging American Civil War."

Overall, the 1862 Morrill Act allocated 17,400,000 acres of land, which when sold yielded a collective endowment of \$7.55 million.

There are currently 76 land-grant universities created by the original 1862 Morrill Act.

#### **The Second Morrill Act**

A second Morrill Act in 1890 was also aimed at the former Confederate states. This act required each state to show that race was not an admissions criterion, or else to designate a separate land-grant institution for persons of color. Among the seventy colleges and universities which eventually evolved from the Morrill Acts are several of today's historically Black colleges and universities. Though the 1890 Act did not require the provision of federal land, it granted colleges under that act the same legal standing as the 1862 Act colleges; hence the term "land-grant college" properly applies to both groups. The 1890 Land Grant Universities are a network of historically black colleges and universities dedicated to providing educational opportunity for all through innovative scientific research and community-minded extension programs.

#### **Tribal Colleges**

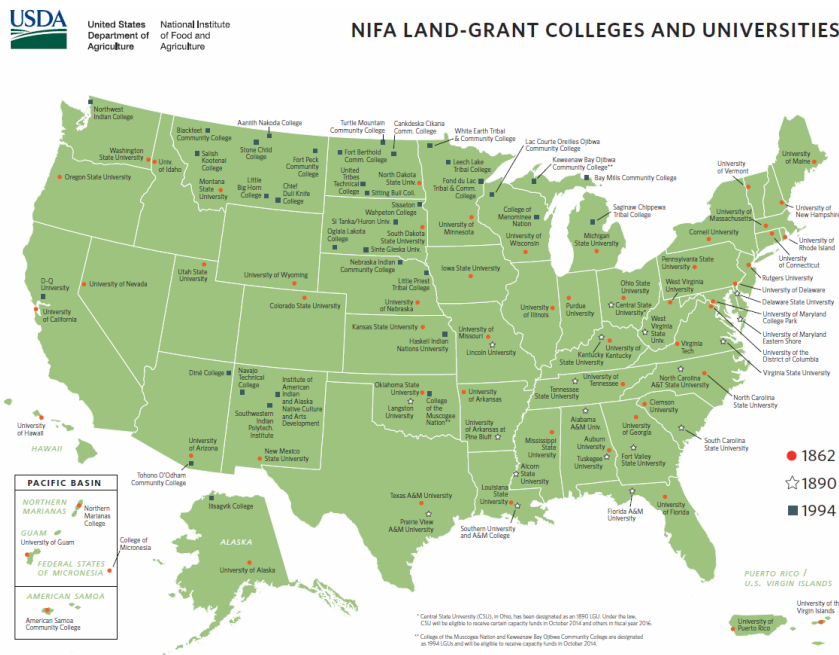
The 1994 Land-Grants often serve as the primary institution of scientific inquiry, knowledge and learning for reservation communities. Funding for these institutions allows them to address the questions that matter to these communities such as protecting reservation forests or monitoring water quality. Projects may help a tribe improve bison herd productivity, discover whether traditional plants can play a role in managing diabetes or control invasive species.

The 1994 Land Grants receive four main types of grants. Tribal College Equity supports formal education at these schools. Tribal College Extension supports informal, community-based learning such as farmer education, youth development and rural entrepreneurship. Tribal College Research helps the 1994 Land-Grants build scientific capacity and provide a strong foundation in research knowledge for students.

The 1994 Land-Grants also have a targeted formula fund that can be used at the discretion of Institution leadership. The Tribal College Endowment program receives annual appropriations from Congress, but the institutions receive money from the interest earned during the previous year. The amount each school receives is based in part by the number of Native students attending the school. This is determined annually through the Indian Student Count.

The Federally Recognized Tribes Extension Program (FRTEP) allows 1890 and 1862 Land-Grants to provide informal learning to support youth development and agricultural productivity. They complement the Extension efforts of the 1994 Land-Grants, often serving in states that do not have a 1994 Land-Grant.

Map (below) and list of 1862, 1890 and 1994 Land Grant Institution can be found [here](#).



### Hispanic-serving agricultural colleges and universities (HSACUs)

The Food, Conservation and Energy Act of 2008 (FCEA) authorized establishment of a group of HSACUs to be eligible for NIFA Integrated Research, Education, and Extension Competitive Grants Programs. The number of total Hispanic Serving Institutions (HSIs) in the United States is growing as are the number of HSACUs. NIFA’s funding programs for these institutions contribute to the diversity of talented agricultural scientists through enhanced access to education, especially in agriculture and food sciences. HSACUs play an important

role in NIFA's education portfolio by supporting many institutions of higher learning in the Southwestern United States.

NIFA's Hispanic Serving Institutions Education Grants Program is competitive. The grant promotes and strengthens HSIs and HSACUs so they can carry out higher education programs in the food and agricultural sciences, natural resources, and nutrition. Through this grant, these institutions build capacity, establish linkages with businesses and the U.S. Department of Agriculture, conduct outreach to Hispanic/Latino communities, develop new curricula, and meet local and national educational and workforce needs in agriculture.

NIFA certifies HSACUs under three criteria: 1) At least 25 percent of the institution's full-time student enrollment is Hispanic; 2) The institution offers accredited agriculture-related programs; and 3) Hispanic students receive at least 15 percent of the degrees awarded in agriculture-related programs over the two most recent completed academic years.

The list of HSACUs can be found [here](#).

#### Non-Land Grant Colleges of Agriculture (NLGCA)

The NLGCA program focuses on improving research, outreach and postsecondary level educational activities related to food, agriculture, natural and renewable resources, human sciences and other similar disciplines. The goals of the NLGCA program are to strengthen the capacity of NLGCA institutions to develop infrastructure to carry out agriculture research, teaching and outreach activities; enhance the ability of NLGCA faculty members to engage in agricultural professional development opportunities; and increase the number, quality and diversity of qualified graduates entering the food and agriculture workforce.

A list of NLGCA can be found [here](#).