United States Department of Agriculture

National Institute of Food and Agriculture

FEEDING THE WORLD THROUGH USER-INSPIRED SCIENCE

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE
2015 ANNUAL REPORT

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OUR VISION

Catalyze transformative discoveries, education, and engagement to address agricultural challenges.

A MESSAGE FROM THE DIRECTOR, NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

"Funding research should be considered as an investment in our nation's future, an investment that will pay big dividends in the years to come."

I'm pleased to report the accomplishments of the National Institute of Food and Agriculture (NIFA) for Fiscal Year 2015.

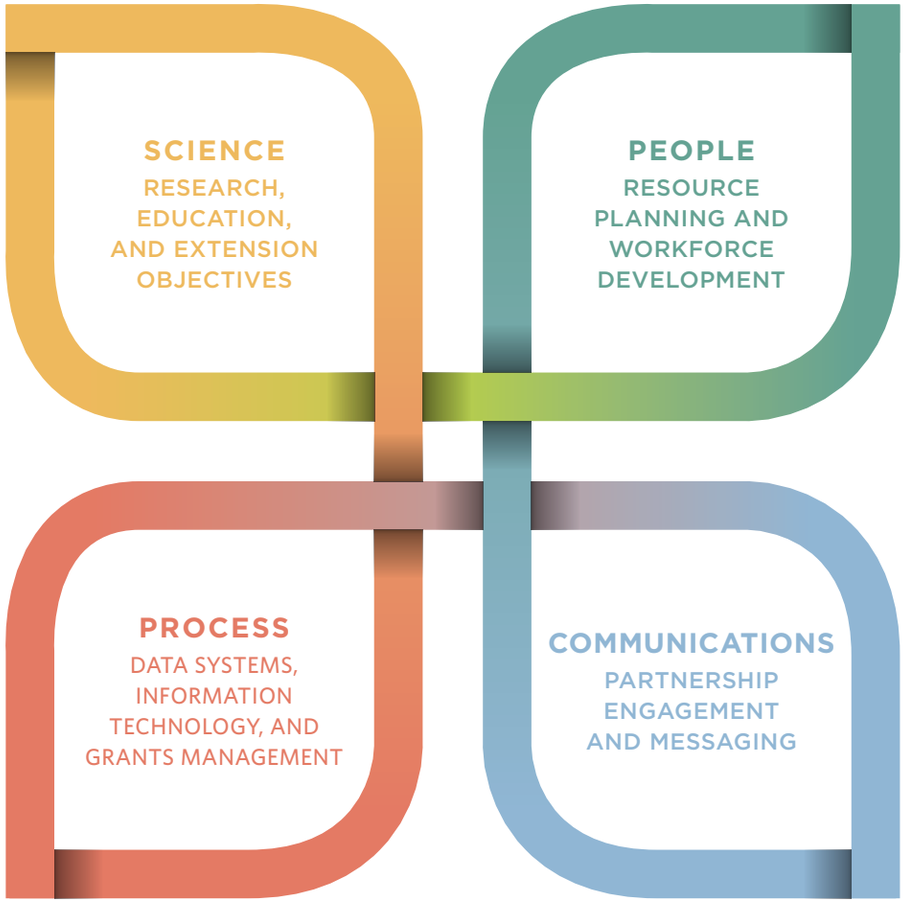
This annual report highlights the amazing work undertaken by our grantees in the areas of research, education, and extension in 2015. The successes we underscore in this report are the result of our strong collaboration with our nation's land-grant universities, non-land grant universities, farmers and livestock producers across the country, small businesses, other federal agencies, our USDA sister agencies, public and private organizations and associations, and our growing list of international partners. Supported by the funding provided by Congress, our grantees and partners are making significant progress to address our nation's most compelling societal problems related to food security and safety, nutrition and public health, natural resource stewardship, jobs, and economic health.

As this report accentuates, investments into our flagship competitive grants program, the Agriculture and Food Research Initiative (AFRI), and other critical competitive and capacity programs, are helping to meet the food, fiber, fuel, and shelter demands of a world population that is racing toward a projected nine billion by 2050 in the face of diminishing land and water resources and variable climate. Increased funding for NIFA can help accelerate much-needed solutions to critical and daunting food and agriculture challenges.

It's a privilege for me to lead this phenomenal agency and work alongside such stellar staff. Through their dedication and commitment, our talented NIFA employees are leading the way to ensure global nutritional security through the availability, accessibility, and affordability of safe, ample, and nutritious food. Our taxpayers are truly seeing the benefits.

We look forward to the coming year, and the transformative and remarkable discoveries made by our grantees, through NIFA funding, to solve our world's most pressing societal and global challenges.

SONNY RAMASWAMY



2014-2018 NIFA STRATEGIC PLAN GOALS

The work NIFA undertakes is anchored under four strategic goals, which are aligned with Congressional priorities, USDA strategic objectives, and the Research, Education, and Economics mission area Action Plan.

GOAL 1—SCIENCE:

Catalyze exemplary and relevant research, education, and extension programs.

GOAL 2—PEOPLE:

Transform NIFA into a model agency with a highly motivated workforce.

GOAL 3—PROCESS:

Institutionalize streamlined, effective technologies, policies, and processes.

GOAL 4—COMMUNICATION:

Advance America's global preeminence in food and agricultural sciences.

AFRI

The Agriculture and Food Research Initiative (AFRI) is the nation's premier peer-reviewed competitive grants program for fundamental and applied agricultural sciences.

In FY 2015, Congress appropriated $325 million to NIFA to award competitive grants through AFRI to address food and agricul-tural sciences. This was an increase of $9 million from 2014. In 2015, AFRI addressed the six agricultural and food priorities of the Agricultural Act of 2014:

- 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.

NIFA's AFRI funding portfolio includes research, education, and extension grants and integrated research, extension, and education grants that continue to address key problems of national, regional, and multi-state importance. AFRI projects touch all components of agriculture, including farm efficiency and profitability, ranching, renewable energy, forestry (both urban and agroforestry), aquaculture, rural communi-ties and entrepreneurship, human nutrition, food safety, biotechnology, and conven-tional breeding. AFRI-funded science is vital to meeting food, fiber, and fuel demands as the world's population races toward a projected 9 billion by 2050 and in the face of diminishing land and water resources and an increasingly variable climate. In addition, AFRI programs help develop new technolo-gies and a workforce that will advance our national security, our energy self-sufficiency, and the health of Americans.

AFRI FY15 FUNDING: $274,497,609

PROJECTS: 554

IMPACTS

PLANT HEALTH AND PRODUCTION AND PLANT PRODUCTS:
Virginia State University established a vegetable soybean (edamame) research program and released three varieties, "Asmara," "Owens," and "Randolph." Hundreds of breeding lines are also being evaluated for their agronomic performance, yield potential, and nutrient contents. Edamame is a value-added specialty crop and a potentially profitable option for small farmers in Virginia. With support from the Virginia Tobacco Commission, researchers are also working with local growers to commercialize the three edamame varieties. So far, 25 growers have been contracted to grow and market these edamame varieties. The project has purchased harvesting and processing equipment and set up a centralized processing facility in Farmville, Virginia.

AGRICULTURE SYSTEMS AND TECHNOLOGY:
Automated berry processing systems often damage the fruit, which results in lower profitability for growers and marketers. To counter this, a University of Georgia-led research team is developing an advanced sensor system to help harvest and process fresh-market highbush blueberries at high-speed and with low yield loss. The second-generation berry impact recording device (BIRD) is one part of a multi-faceted effort being funded NIFA. In addition to BIRD, researchers are using a $2.4 million Specialty Crop Research Initiative grant to develop high throughput phenotyping technology and a semi-mechanical harvest-aid system.

AGRICULTURE ECONOMICS AND RURAL COMMUNITIES:
Researchers at the University of Connecticut are studying the impact of changing climatic conditions on dairy farm productivity in Wisconsin. Wisconsin is a major dairy-producing area where winters are typically very cold and snowy and summers are hot and humid. According to the researchers, the state is an ideal geographical region for examining the effects of a range of climatic factors on dairy production. The study identified the effects of temperature and precipitation, both jointly and separately, on milk output. The analysis showed that increasing temperature in summer or in autumn is harmful for dairy production, whereas warmer winters and warmer springs are beneficial. In contrast, the study showed that more precipitation had a consistent adverse effect on dairy productivity. Overall, the analysis showed that over the past 17 years, changes in climatic conditions have had a negative effect on Wisconsin dairy farms. Alternative scenarios predict that climate change would lead to a 5 to 11 percent reduction in dairy production per year between 2020 and 2039 after controlling for other factors.

ANIMAL HEALTH AND PRODUCTION AND ANIMAL PRODUCTS:
Bovine respiratory disease (BRD) is the leading natural cause of death in beef and dairy cattle, causing annual losses of more than 1 million animals and $692 million. This disease complex includes a number of viruses and bacteria that are responsible for up to 50 percent of the cattle death in feedlots. An **AFRI Coordinated Agricultural Project** (AFRI-CAP) led by Texas A&M University is identifying genetic loci and genomic rearrangements associated with BRD and using these data to develop diagnostic tests and selection tools to identify BRD-resistant animals. Incorporating BRD into genetic evaluations and selection decisions offers a sustainable approach to reduce disease incidence.

BIOENERGY, NATURAL RESOURCES, AND ENVIRONMENT:
Researchers from 22 organizations are working on a NIFA-funded AFRI-CAP grant, the Northwest Advanced Renewables Alliance (NARA), one of seven regional bioenergy CAP grants, to convert wood waste to renew-able aviation fuel. Wood waste includes log-ging residues that would otherwise end up in landfills. Their industrial partner, **Gevo**, adapt-ed their **Integrated Fermentation Technology** and hydrocarbon technology to successfully convert the waste wood cellulosic sugars to Gevo's alcohol-to-jet-fuel product. NARA's airline partner, Alaska Airlines, plans to fly a demonstration flight using 1,000 gallons of al-ternative biofuel, once the fuel receives ASTM certification. Sustainable biofuels are critical in helping the airline industry reduce its carbon footprint and break our nation's dependence on fossil fuels.

FOOD SAFETY, NUTRITION, AND HEALTH:
Peanuts are the 12th most valuable cash crop in the United States. Allergies to peanuts are among the most severe of all food allergies, affecting some 2.8 million people in the United States, including 400,000 school-aged children. Now, however, there is good news from the North Carolina Agricultural and Technical State University (NC A&T), where scientists have discovered a way to remove up to 98 percent of the allergens. Researchers found that by soaking roasted, shelled, and skinned peanuts in a solution containing food-grade enzymes, they can drastically reduce two key allergens. The process does not affect flavor, and treated peanuts can be eaten whole, in pieces, or as flour in various products. The process has been validated at the **University of North Carolina at Chapel Hill** through human clinical trials using skin prick tests. NC A&T officials expect reduced-allergen peanut products to hit store shelves soon.

OUR SCIENCE PORTFOLIOS

MAKING A DIFFERENCE THROUGH RESEARCH, EDUCATION, EXTENSION

In 2015, NIFA developed, delivered, and evaluated the agency's science objectives through nine portfolios of science, education, and extension programs administered through the agency's four programmatic institutes:

Institute of Food Production and Sustainability (IFPS)

Institute of Bioenergy, Climate, and Environment (IBCE)

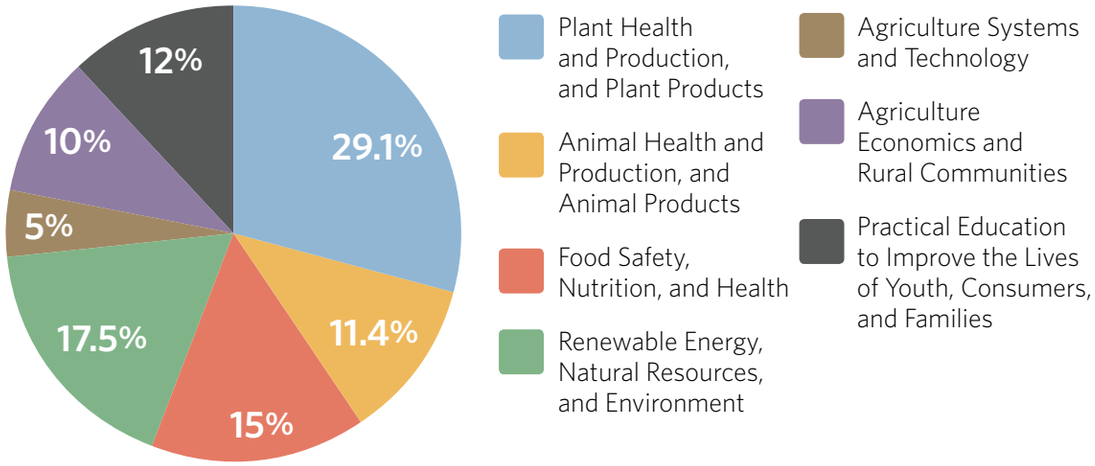
Institute of Food Safety and Nutrition (IFSN)

Institute of Youth, Family, and Community (IYFC)

PORTFOLIO	INSTITUTE
Sustainable Ag Production Systems	IFPS, IBCE, IFSN, IYFC
Education & Multicultural Systems	IYFC
Environmental Systems	IBCE
Family & Consumer Sciences	IYFC
Bioenergy	IFPS, IBCE
Human Nutrition	IFSN, IYFC
Food Safety	IFSN
Agroclimate Science (Climate Change)	IFPS, IBCE
Youth Development	IYFC

PORTFOLIO	TOTAL COMPETITIVE PROJECTS FUNDING BY PORTFOLIO	COMPETITIVE PROJECTS ACTIVE IN 2015
Sustainable Ag Production Systems	$263,188,718	645
Education & Multicultural Systems	206,955,301	109
Environmental Systems	200,355,306	270
Family & Consumer Sciences	74,208,921	239
Bioenergy	68,810,035	31
Human Nutrition	42,815,741	106
Food Safety	35,920,232	106
Agroclimate Science (Climate Change)	33,256,643	17
Youth Development	10,719,936	61

COMPETITIVE FUNDING BY FARM BILL PRIORITY AREA



IMPACTS

In 2015, NIFA funding enabled numerous, significant efforts by our grantees to solve significant societal challenges. Their work is moving us closer to achieving our vision to catalyze transformative discoveries, education, and engagement to address agricultural challenges.

The following describes our science portfolios and a sampling of the tremendous impacts of projects undertaken by our grantees.

ENSURING SUSTAINABLE, ADAPTIVE AGRO-ECOSYSTEMS IN RESPONSE TO CLIMATE CHANGE

THE AGROCLIMATE SCIENCE PORTFOLIO FUNDS RESEARCH, education, and extension activities aimed to develop sustainable agriculture and forestry-based strategies to adapt and mitigate the effects of climate variability and change. Producers need new and sustainable management methods and technologies that increase their resiliency to climate variability. These methods include the selective breeding of crops and livestock, helping agricultural sector and forest working lands to reduce atmospheric greenhouse gas emissions and maximize carbon sequestration. The portfolio specifically seeks to:

- Reduce energy, nitrogen, carbon, and water footprints in agricultural production systems;
- Develop and implement new nitrogen fertilizer recommendations that optimize yields while reducing greenhouse gas emissions;
- Improve agricultural and forest sector inputs to climate change models;
- Identify new production practices that increase soil carbon while reducing greenhouse gas emissions; and
- Translate genomics research and resulting technologies to the agricultural and forestry production sector to adapt to climate variability.

IMPACTS

Wearing collars equipped with GPS tracking devices, grazing beef cattle are part of a Kansas State University study tracking beef production vulnerability across the southern Great Plains. The study aims to increase the resiliency of beef cattle operations on grazing lands and wheat pastures so producers can better sustain future productivity through potential impacts of climate change. Researchers are also looking for the best ways to reduce beef production's environmental footprint, including finding more efficient ways to use water, best grazing practices, best forages, and improving soil and water quality.

Researchers have determined that precipitation and temperature variations over the past 20 years have suppressed the U.S. average soybean yield gain by about 30 percent, representing a loss to the industry of $11 billion nationally. In Ohio alone, that suppression is estimated to have cost $2.9 billion during the past 20 years, according to a NIFA-funded study by The Ohio State University's Ohio Agricultural Research and Development Center scientists. The study documents temperatures, changes in cultural practices, soybean varieties and technology in soybean production from 1970 to the present. The study found that for every 1 C (1.8 F) rise in temperature during the growing season, soybean yields fell by about 2.4 percent. Some crop management strategies such as the development of new cultivars and hybrids, changes in planting dates, the use of cover crops, and greater management of crop residues from the previous year could help limit the potential negative impacts of weather variations.

Lettuce contains a gene that prevents seed germination if it gets too hot, and that could be trouble in California and Arizona—two states that produce more than 90 percent of the lettuce grown in the United States. Researchers at the University of California-Davis identified a gene in wild lettuce that allows for germination at higher temperatures and transferred that gene into commercial lettuce. The resulting lettuce variety can be grown in more locations with multiple growing seasons, reducing the need for shipping. Additionally, growers do not have to use as much water to cool the soil as they would use for traditional lettuce varieties. Collectively, the new lettuce variety results in greater profit for farmers, more fresh lettuce for consumers, and reduced greenhouse gas emissions.

American corn production covers about 95 million acres on 400,000 farms and brought in about $65 billion in 2013. NIFA has provided $20 million in funding to sustain one of the nation's most important farm crops through weather extremes. Iowa State University is leading a multidisciplinary team of researchers from 10 land-grant universities and USDA's Agricultural Research Service on the Sustainable Corn Project to mitigate and adapt the Midwest "Corn Belt" to climate change. Since the project began in 2011, researchers have created a central database to better evaluate how drainage, cover crops, tillage, fertilizers, and crop rotations affect water, carbon, and nitrogen cycles under variable weather conditions. In addition, the team is training 159 researchers—undergraduate through post-doctoral—to become the next generation of scientists who can help increase future food production and ensure the integrity and resilience of natural resources.

ENSURING ENERGY INDEPENDENCE THROUGH BIO-BASED ENERGY SYSTEMS

NIFA'S BIOECONOMY-BIOENERGY-BIOPRODUCT PORTFOLIO facilitates the development of sustainable regional production systems for biofuels and bio-based products through research, product development and demonstration, extension, and education. By creating non-carbon based fuels, power sources, chemicals, and other products, these programs contribute to rural economic development; mitigate climate change; impact the ecosystem by reducing greenhouse gases and improving water quality, wildlife, and pollinator habitat; and improve food and energy security. NIFA leverages resources of other federal agencies and private sector investments such as the Department of Energy's pilot scale biorefineries, USDA's Rural Development's commercial Biorefinery Loan Guarantees and Biomass Crop Assistance programs.

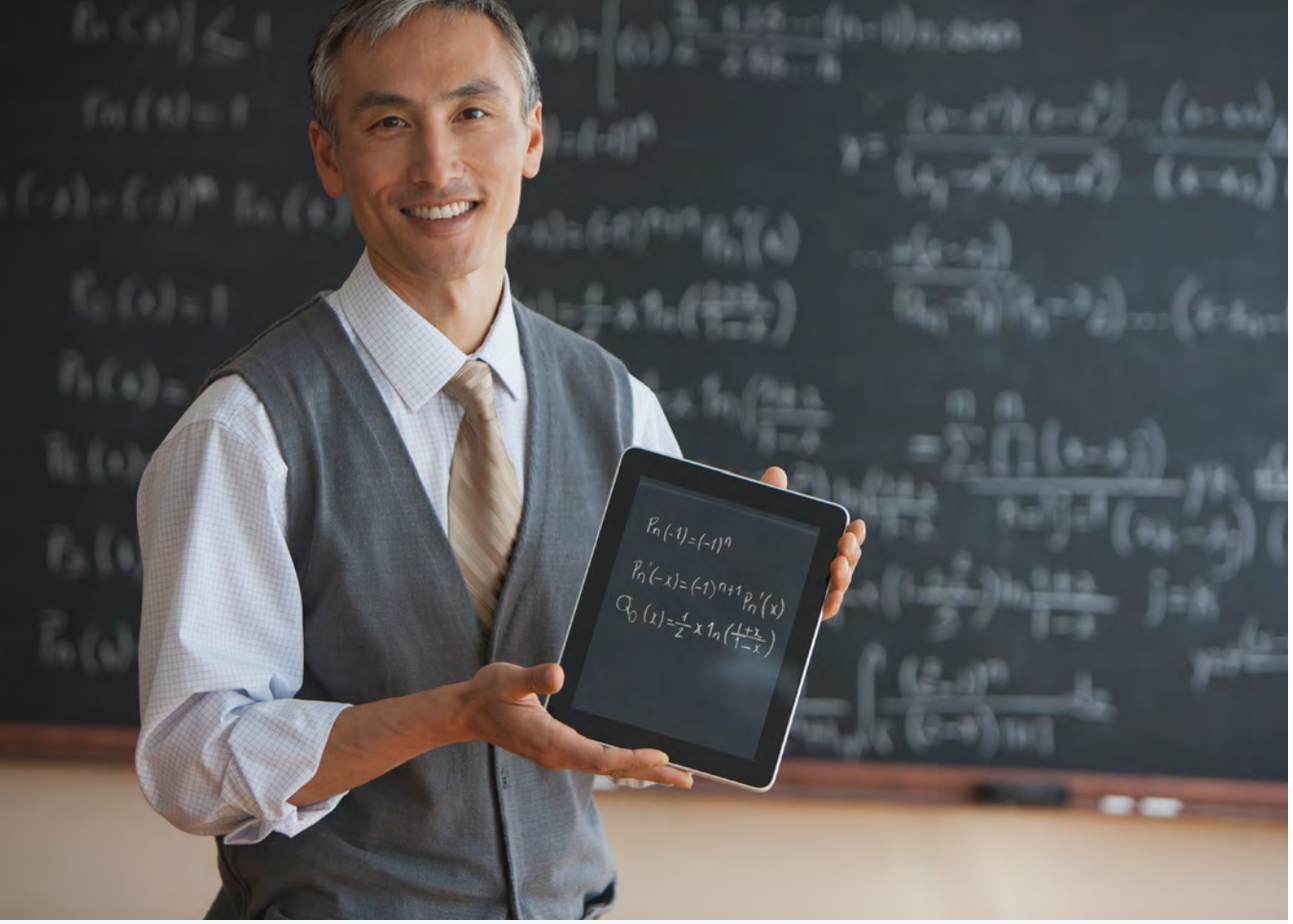
IMPACTS

Renewable sources of biomass increase the availability of renewable fuels and biobased products to help replace the need for gasoline and diesel in vehicles, and diversify our nation's energy portfolio. Three Biomass Research and Development Initiative projects include a grant to the Quad County Corn Cooperative in Galva, Iowa, to retrofit an existing corn starch ethanol plant to produce byproducts for feed markets and the biodiesel industry. **Cooper Tire & Rubber Co.** in Ohio is working to use plant residue from the guayule shrub, used for rubber production, for use in biopower and conversion to jet fuel precursors. A University of Wisconsin project is developing closed-loop energy systems using dairy manure as source of fiber and fertilizer.

Supported by a NIFA **Small Business Innovation Research** grant, Altaeros Energies of Somerville, Massachusetts, developed the Buoyant Airborne Turbine (BAT), which uses aerial lift platforms to maintain the turbines in flight. These turbines can consequently reach altitudes higher than traditional wind towers. The strong, consistent winds at these altitudes enable the BATs to generate more than twice the energy output of similarly rated turbines. BATs can also support and stabilize heavy communications and monitoring equipment in the air, offering an alternative to cell towers that would reduce infrastructure costs. The BAT was successfully commercialized in 2015 and telecom group SoftBank invested $7 million for future deployments of BAT technology in Japan.

A study at the University of Minnesota suggests that driving vehicles that use electricity from renewable energy instead of gasoline could reduce air quality-related mortalities by 70 percent. Researchers looked at liquid biofuels, diesel, compressed natural gas, and electricity from a range of conventional and renewable sources. Their analysis included not only the pollution from vehicles, but also emissions generated during production of the fuels or electricity that power them.

The Northeast Woody/Warm-season Biomass Consortium (NEWBio), led by **Penn State University**, is investigating a variety of feedstocks including short rotation woody crops, switch grass, and miscanthus for advanced biofuels. Driven by the broad societal benefits that sustainable bioenergy value chains can provide, NEWBio aims to overcome existing barriers and dramatically increase the sustainable, cost-effective supply of lignocellulosic biomass while reducing net greenhouse gas emissions, enhancing ecosystem services, and building vibrant communities.



EDUCATING THE NEXT GENERATION OF SCIENTISTS

THE EDUCATION AND MULTICULTURAL SYSTEMS PORTFOLIO provides leadership and administrative guidance to education programs that serve secondary and postsecondary institutions. This portfolio attempts to solve the challenges associated with educating the next generation of food, agriculture, natural resources, and human scientists. This includes providing continued support of student and teacher training, providing financial support in targeted areas, and advancing the development of a diverse food and agricultural workforce. In 2015, NIFA-funded education programs trained 1,116 undergraduate, 954 graduate, and 398 postdoctoral researchers.

IMPACTS

The **Tennessee State University Cooperative Extension Program** has expanded from three counties to 50, serving limited-resource, hard-to-reach, and socially disadvantaged areas through programs. One program is the **Master Meat Goat Producer Program** that provides education, information, and insight to broaden production management skills and improve competitiveness in the marketplace to increase profitability for meat goat producers. Over the last 10 years, the program has led Tennessee to become the second largest goat-producing state in the country with more than 5,000 producers.

Boots to Roots, a **Texas State University** (TSU) program, helps female and Hispanic military veterans earn bachelor's degrees in agriculture and other STEM degree programs. Boots to Roots is the only NIFA grant program specifically for veterans to obtain agriculture and STEM degrees. The students who participate in Boots to Roots gain hands-on experience at TSU's Students' Sustainable Farm, engage in faculty-led and mentored undergraduate research, and present research at conferences. Participants also volunteer their services with community organizations and schools, including developing lessons and teaching agriculture or science to K-12 students.

The **University of Nebraska Extension Husker Mobile Beef Lab** is teaching Nebraska youth about microbiology, ruminant nutrition, food production, forage resources management, anatomy and physiology, and more. The mobile lab provides an opportunity to discuss animal welfare in the beef industry. Youth learn about the science of the digestive system and the four compartments of the cow's stomach. Nebraska Extension first introduced the traveling exhibit in eastern Nebraska in September 2011 and since then has traveled to more than 70 locations with more than 15,000 youth and adult participants. A second mobile lab is available in western Nebraska.

New Mexico Highlands University's Achieving in Research Math and Science (ARMAS) program is designed to increase the number of Hispanic students earning a Bachelor of Science degree. NIFA provides financial support for the ARMAS program, which has helped more than 1,100 students since its inception in 2009. ARMAS received recognition from the White House Initiative on Educational Excellence for Hispanics.

PROTECTING AND SUSTAINING OUR ENVIRONMENT

THE ENVIRONMENTAL SYSTEMS PORTFOLIO COMPRISES A WIDE range of programs that address issues related to the fundamental resources that provide for the growth of food and fiber—soil, water, and air—essential to life on Earth. These are the essential components for a wide range of complex ecosystems that provide ecosystem services:

- Provisioning services—food, raw materials, water, genetic resources, energy, minerals, and medicinal resources;
- Regulating services—carbon sequestration and climate regulation, waste decomposition, purification of water and air, and pest and disease control;
- Supporting services—essential services such as nutrient recycling, primary production and soil formation that are necessary for the production of all other ecosystem services; and
- Cultural services—nonmaterial services that humans obtain from ecosystems including spiritual experiences, historical understanding, recreational experiences and science, and education.

IMPACTS

Attaining sustainable landscapes is not an easy endeavor in the modern world. To make the process of envisioning sustainable agricultural landscapes a little less daunting, the University of Wisconsin-Madison created **SmartScape**, a web-based application that allows users to make hypothetical changes to agricultural landscapes, and see what effect these changes have on a variety of important goods and services. Using a browser, users select different places on the landscape using a simple query tool and enact transformations on selected land, such as converting row-crop agriculture into grasslands. Outcomes are returned to the user's browser to visualize the environmental and economic outcomes of the land-use transformations. Scenarios can be evaluated within seconds, greatly enhancing the stakeholder's decision-making processes.

A **Small Business Innovation Research** (SBIR) grant from NIFA is supporting a small company in Wise, Virginia, Micronic Technologies, to pursue commercialization of its new technology to treat unsafe well water to the point where the water meets U.S. Environmental Protection Agency clean drinking water safety standards. The technology, MicroDesal, quickly evaporates the water to separate impurities. MicroDesal then recaptures the liquid for safe use. Awarded an SBIR Phase I grant, the company successfully demonstrated the technology's feasibility with outstanding results, removing more than 95 percent of nitrate contaminants consistently from eight community wells over three seasons. Nitrites were undetectable. The woman-owned business employs military veterans and has student interns to provide them real-world experience.

Radon is a colorless, odorless, radioactive gas that is present in Alaska, particularly in interior Alaska uplands and parts of the Matanuska and Susitna valleys. The Environmental Protection Agency says that radon is the second leading cause of lung cancer. Awareness of radon, radon testing, and mitigation are important health issues to Alaskans. University of Alaska Fairbanks Cooperative Extension Service agents offered more than 20 workshops in seven communities that addressed radon prevention, testing and mitigation, and kits were made available statewide for radon testing. Nearly 400 individuals received healthy homes or radon testing and mitigation education through workshops. Extension agents distributed or sold 383 long-term radon detection kits to people. Forty-six homeowners who completed the testing learned their homes had radon levels above EPA's recommended action level. The radon coordinator responded to 115 questions about radon over the radon hotline. As a result of a training offered by the radon expert and Alaska's radon coordinator, Alaska school districts have tested 15 schools for radon. One classroom had a radon level at which mitigation was recommended.

ENABLING VIBRANT, RESILIENT COMMUNITIES

THE FAMILY AND CONSUMER SCIENCES PORTFOLIO FOCUSES on strengthening families, farms, communities, and the economy. NIFA supports this effort through research, education, and extension programs that address a full spectrum of the human and social dimensions of food, agriculture, natural resources, and human sciences. FCS takes a holistic approach to address broad societal challenges, drawing from a range of disciplines to achieve optimal quality of life for individuals, families, and communities. Grant programs include:

- AgrAbility, an assistive technology program for farmers with disabilities;
- Risk Management Education Partnerships;
- Extension Disaster Education Network;
- Farm Business Management and Benchmarking;
- New Technologies for Ag Extension;
- Regional Rural Development Centers;
- Rural Health and Safety Education;
- Small Business Innovation Research Program;
- Smith-Lever Special Needs Competitive Grants;
- State Energy Extension Partnership;
- Youth Farm Safety Education Certification; and
- Interagency agreements with the Department of Housing and Urban Development, Department of Defense, and the Substance Abuse Mental Health Services Administration.

IMPACTS

Native American youth in North Dakota's Sioux County and the Standing Rock Reservation face many challenges. 2013 Kids Count! data reports 51.1 percent of children ages 0-17 are living in poverty. Research indicates that being raised in poverty places children at a higher risk for a wide range of issues including social and emotional stress, physical and mental health issues, poor cognitive and academic outcomes, higher rates of risky behavior. Sioux County has the highest average dropout rate in North Dakota at 12.2 percent. Suicide is the second leading cause of death among American Indian and Alaska Native youth aged 10 to 34 years. As a positive youth development organization, the North Dakota State Extension Service's mentoring program, **"4-H Youth and Families with Promise,"** is an evidenced-based program designed to strengthen academic and social skills using activities related to mentorship, leadership, community service and group project work. Their program offers videography, business development, entrepreneurship, 3D printing, beadwork, leather craft, outdoor skills, service learning, and literacy activities. As of early 2014, 187 tribal youth ages 5 to 17 are being reached through the work of 44 mentor volunteers. Schools where mentored youth attend report a 20 percent increase in attendance and the number of youth passing their classes has more than doubled. The program has also helped address truancy and dropout issues facing schools where the program is conducted.

Synthetic indigo dyes are used to give jeans their hue, but that was not always the case. Only two countries, China and Germany, currently manufacture the dyes that are used to color jeans. A **Small Business Innovation Research** program grantee, Stony Creek Colors, located in Goodlettsville, Tennessee, has found a more efficient way to produce natural indigo dyes using the indigo plant, which avoids the environmental contamination that results from synthetic dyes and also creates jobs in America. The company's goal is to replace 2.8 percent of synthetic indigo dye with natural dyes in the next five years. To achieve that, Stony Creek Colors will need to produce 15,000 acres of indigo here in the United States.

Mary Dunn, a Wisconsin dairy farmer, suffers from severe arthritis and many other physical obstacles. An infection resulted in her right leg being amputated below the knee, and her left foot had to be fused to her leg at the ankle. Thanks to Wisconsin **AgrAbility**, funded by NIFA, Dunn was able to acquire essential assistive technologies to keep her in business. Among them were an electric feed cart, an automated feeding system, extended steps and handrails for her tractors, a tracked milking system, and a utility vehicle.

ENSURING A SAFE FOOD SUPPLY

THE NIFA FOOD SAFETY PORTFOLIO FOCUSES ON STRENGTHENING the food safety system by reducing the incidence of foodborne illness to the greatest extent possible. The portfolio addresses a wide variety of food safety issues that include:

- Prevention, detection, and control of food and waterborne pathogens;
- Understanding the ecology of foodborne pathogens, including viruses;
- Understanding plant-pathogen interactions;
- Enhancing food safety and food quality through improved processing technologies;
- Applying nanotechnology in production, processing, packaging, and safety of food;
- Improving the safety of fresh and fresh-cut produce, including specialty crops;
- Ensuring safety across agricultural production systems, including organic agriculture;
- Using a systems approach for developing effective mitigation strategies for antimicrobial resistance;
- Understanding the interactions between food safety, nutrition, and human health; and
- Providing food safety education, outreach, and training to a variety of audiences.

IMPACTS

Human noroviruses cause more than five million cases of foodborne disease every year, more than any other pathogen including *Escherichia coli* and *Salmonella*. A team of researchers, led by North Carolina State University, have discovered how noroviruses contaminate fresh produce, such as lettuce and kale. The research team has developed surface sanitizers that reduce norovirus on food service worker gloves and food processing surfaces. Other promising approaches for the inactivation of noroviruses include gamma irradiation, high intensity pulsed light, copper surfaces, and nanomaterials. The project's education component is also training and placing food safety virologists, armed with the skills to tackle future food safety challenges, in academia and industry.

According to the Centers for Disease Control and Prevention, an estimated one in six people in the United States get sick from eating contaminated food each year. A team of researchers from Clarkson University in upstate New York examined how microbes from manure may play a role in contaminating produce in the field. The team measured how far common bacteria—including *Salmonella* and *E. coli*—are likely to travel downwind from manure application sites by looking at samples from several distances and measuring the presence of illness-causing bacteria. The researchers also used computer models to predict produce contamination over a larger range of probable dispersion. Combining these data, the team found that produce fields should be set back from areas of manure application by at least 160 meters.

The University of Vermont Extension and the **Vermont Vegetable and Berry Growers Association** collaborated to develop the practical, affordable, and innovative **Community Accreditation for Produce Safety** (CAPS) to meet the needs of Vermont's diverse produce farms. The certification reassures customers and retailers that produce grown locally was handled using best practices to minimize food safety risk. The Food Safety Modernization Act targets large-scale producers with food safety practices and certification programs but it leaves medium-sized and small producers without food safety credentials that would offer them credibility in the marketplace. So far, the CAPS program has engaged growers with approximately 1,500 acres of total vegetable production with an estimated value of $9 million in annual sales for the state.

IMPROVING CITIZENS' HEALTH THROUGH NUTRITION

OBESITY IS ONE OF THE MOST CHALLENGING HEALTH CRISES the United States has ever faced. Poor diet and lack of physical activity are the most important factors contributing to an epidemic of overweight and obesity in this country. The Trust for America's Health issued its report "F as in Fat: How Obesity Threatens America's Future, 2013," noting that two-thirds of adults and nearly one-third of children and teens in America are currently obese or overweight, putting them at an increased risk for more than 20 major diseases, including type 2 diabetes and heart disease. Programs within the Human Nutrition portfolio seek to:

- Improve knowledge about the behavioral, cultural, and psychosocial factors that influence obesity;
- Develop successful obesity prevention interventions;
- Develop interventions that include dietary guidance in community food programs; and
- Improve knowledge about how bioactive components of food affect gastrointestinal health.

IMPACTS

Healthy food incentive programs at farmers markets have been gaining national momentum as a means to grow local economies, support community farmers, and provide greater access to healthy food by low-income families and individuals. Given these successes, **Cornell Extension** partnered with **Field and Fork Network** and **Fair Food Network** to develop Double Up Food Bucks (DUFB). DUFB is a project awarded from NIFA's new Food Insecurity Nutrition Incentive grants program. The program matches Supplemental Nutrition Assistance Program purchases of fresh fruits and vegetables, up to $20 per visit, at partici-pating farmers markets. Since its launch, more than 3,100 transactions were processed, 92 percent of customers increased consumption of fresh fruits and vegetables and 70 percent of participating farmers are making more money.

NIFA's **Expanded Food and Nutrition Education Program** (EFNEP) provides nutrition education to low-income families, especially those with young children. EFNEP educators are members of the communities they serve, trained and supervised by university and county-based professionals. Using hands-on methods, they teach participants how to eat healthy, be more physically active, stretch their food dollars, handle food safely, and be more food secure. The program operates in all 50 states, in more than 800 counties, reaching approximately 500,000 people each year; about 74 percent of adult participants are from minority populations. In 2015, EFNEP provided $67.9 million to 75 land-grant universities that worked directly with 119,351 adults and 377,702 children. Through EFNEP, 95 percent of adults improved their diet, for example, by consuming an additional ½ cup of fruits.

RootDown LA, a community food project operating in three South Los Angeles neighborhoods with the help of the youth participants, works closely with members of the community to grow fresh fruits and vegetables and provide access to more quality food. The major encouragement of all of RootDown LA's activities is for people to choose to eat good food. The impact also goes beyond nutrition and access to food; RootDown LA provides employment for local youth to manage activities at their various sites. Many early participants are now paid staff who handle day-to-day operations and manage youth interns and the network of neighborhood gardens.

Food deserts are locations without ready access to fresh, healthy, and affordable foods. NIFA is working to eradicate food deserts through the **Community Food Project** (CFP) grants program. CFPs give communities the funds they need to re-establish local control over their food supply. Funds are helping Choctaw Fresh Produce supply the community with fresh fruits and vegetables. Prior to the $300,000 NIFA grant, virtually none of the produce consumed on the reservation was grown there. The tribe has since constructed a greenhouse, three high tunnels (unheated greenhouse-like structures that protect crops and extend the growing season), a 10-acre fruit orchard, and a packing operation.

ENSURING GLOBAL FOOD SECURITY THROUGH PRODUCTIVE, SUSTAINABLE AGRICULTURAL SYSTEMS

THE SUSTAINABLE AGRICULTURAL PRODUCTION SYSTEMS portfolio aims to support research, education, and extension programs for productive and sustainable agricultural systems to improve our nation's ability to meet growing domestic and global food demand, reduce agriculture's environmental footprint, and solve emerging societal challenges. NIFA provides funding to improve economic opportunity and quality of life for producers and consumers; enhance security, safety, nutrition, and resilience of the food supply; and advance competitiveness and sustainability of agriculture through scientific innovation, formal and informal education, and delivery of improved agricultural products.

IMPACTS

A North Carolina State University project found that urban environments increase pathogen abundance in honey bees and reduce honey bee survival. Researchers selected 15 feral colonies, living in trees or buildings without human management, and 24 colonies managed by beekeepers in urban, suburban, and rural areas. The researchers analyzed the bee colonies to quantify the abundance and diversity of pathogens present and the bees' immune responses to this pathogen pressure. The research team found that colonies closer to urban areas experienced greater pathogen pressure. The probability of survival in laboratory experiments declined three-fold in bees collected from urban environments compared to those collected in rural environments. The results of this study are critically important for developing approaches to protect the health of honey bees, whose numbers have been declining in the United States over the last few years.

Animal science researchers at the University of Missouri are working to improve feed efficiency in beef cattle. Investigators have located the chromosomal regions responsible for growth performance that help cattle get the most out of what they eat. Armed with this knowledge, cattle producers will be able to build their herds by selecting and breeding stock that best possess this trait. These "feed conversion" genes are located on different chromosomes in different breeds, so herd improvement selection criteria will vary by breed. By increasing the nutritional efficiency of their herds, cattle producers will see higher profits by reducing the amount of feed it takes to raise cattle. This will also reduce the environmental footprint of beef production by reducing amount of manure and greenhouse gases.

Darius Jones is a success story. Jones is the vice president and general manager of **Garfield Produce**, a hydroponics farm in South Side Chicago. Garfield Produce is a small company that grows hydroponic herbs and greens, and grosses about $100,000 annually. He formerly served as coordinator of the McCormick Place Rooftop Farm, a 20,000 square-foot farm atop a parking garage in downtown Chicago. At age 17, Jones was sentenced to 15 years in Cook County for a felony. After probation he became interested in farming thanks to an internship with **Windy City Harvest's Farm Incubator Program**. Launched in 2013, Windy City Harvest's Farm Incubator Program was developed with assistance from NIFA's Beginning Farmer and Rancher Development Program. Jones credits agriculture for giving him direction, a meaningful career, and purpose.

Researchers at Iowa State University are investigating how heat stress can influence a pig's fetal development and postnatal life, including the ability to develop and grow. The results of this project have thus far provided important insight into the physiological effects of heat stress. Discoveries obtained from this project are improving understanding of how heat stress directly and indirectly alters post-absorptive nutrient partitioning and tissue synthesis and is a step towards developing future mitigating strategies to maximize pork production during the stressful summer months. The results of this study could have a positive impact on pork producers worldwide.

ENHANCING YOUTH DEVELOPMENT

THE **YOUTH DEVELOPMENT PORTFOLIO** AIMS TO ADVANCE research-based youth development and 4-H through the science of engagement, learning, and change to create a better future for our nation and the world. High quality programs and highly engaged youth, staff, and volunteers are essential to supporting this mission. The Youth Development Portfolio is directly poised to address many of these major issues by:

- Building capacity of the Cooperative Extension System to develop and implement high quality positive youth development programming;
- Building capacity of the Cooperative Extension System to evaluate program effectiveness and impacts; and
- Preparing the youth of the nation with the 21st century skills needed to be ready for work and ready for life.

IMPACTS

Kentucky 4-H makes it possible for more than 150,000 youth each year to experience life skill decision making through development of critical thinking, problem solving, and scientific processing skills. These skills will not only help them in relation to STEM fields, but also allow them to make better, more analytical decisions in all aspects of their lives. 4-H Science Engineering and Technology (SET) programs help youth learn to work as a team, apply critical thinking and develop problem-solving skills, which leads to generating a competitive workforce for Kentucky. 4-H presents SET programs in classrooms, after-school pro-grams, special interest clubs, and competitive teams. A grant allowed 4th grade students in Russell, Spencer, and Wayne counties to conduct **4-H Physics Zoo** where they experi-mented with unequal air pressure, open and closed circuits, components of white light, pulleys, kinetic and potential energy, and the center of balance. High school students in Daviess and Metcalfe counties participated in the **National Science Day "Eco-Bot Challenge"** designing a robot to perform a task related to environmental cleanup. In Jefferson County, home-schooled students were introduced to energy, electricity, and robotics with the **4-H Power of the Wind Curriculum.**

The National Agricultural Literacy Curriculum Matrix is a new approach to promote agricultural literacy among K-12 students. The Matrix, managed by **Utah State University Extension** and part of the **National Agriculture in the Classroom's** (AITC) program, is an online collection of educational resources that are relevant, engaging, and designed to meet the educational requirements and agricultural literacy outcomes for formal educators. The Matrix also serves the needs of AITC programs within each state by providing a system where teachers can find quality materials that meet educational standards. The site, available 24-hours-a-day worldwide, supports teachers regardless of state program, funding, or size.

Educators at Mesa College in San Diego, California, are developing future leaders in agricultural sciences and related fields by providing them with a solid background in STEM education. The **STEM Engagement for the Enrichment of Diverse Students** (SEEDS) program is a four-year effort to encourage underrepresented students, primarily Hispanic, to pursue graduate degrees. The first 20 SEEDS scholars entered the program in June 2015 and are majoring in such STEM fields as anthropology, nutrition, biology, and geology. Along with traditional studies, SEEDS scholars participate in several community projects, serving as mentors to children in elementary and middle schools, volunteering in building community gardens, and increasing community awareness of environmental issues that adversely affect health at a local and global level.

OUR PARTNERS

LAND-GRANT COLLEGES AND UNIVERSITIES

ALABAMA
Alabama A&M University, *Normal*
Auburn University, *Auburn*
Tuskegee University, *Tuskegee*

ALASKA
Ilisagvik College, *Barrow*
University of Alaska, *Fairbanks*

AMERICAN SAMOA
American Samoa Community College, *Pago Pago*

ARIZONA
Diné College, *Tsaile*
University of Arizona, *Tucson*
Tohono O'odham Community College, *Sells*

ARKANSAS
University of Arkansas, *Fayetteville*
University of Arkansas at Pine Bluff, *Pine Bluff*

CALIFORNIA
D-Q University, *(Davis vicinity)*
University of California System-Oakland as Headquarters, *Oakland*

COLORADO
Colorado State University, *Fort Collins*

CONNECTICUT
University of Connecticut, *Storrs*

DELAWARE
Delaware State University, *Dover*
University of Delaware, *Newark*

DISTRICT OF COLUMBIA
University of the District of Columbia, *Washington*

FLORIDA
Florida A&M University, *Tallahassee*
University of Florida, *Gainesville*

GEORGIA
Fort Valley State University, *Fort Valley*
University of Georgia, *Athens*

GUAM
University of Guam, *Mangilao*

HAWAII
University of Hawaii, *Honolulu*

IDAHO
University of Idaho, *Moscow*

ILLINOIS
University of Illinois, *Urbana*

INDIANA
Purdue University, *West Lafayette*

IOWA
Iowa State University, *Ames*

KANSAS
Haskell Indian Nations University, *Lawrence*
Kansas State University, *Manhattan*

KENTUCKY
Kentucky State University, *Frankfort*
University of Kentucky, *Lexington*

LOUISIANA
Louisiana State University, *Baton Rouge*
Southern University and A&M College, *Baton Rouge*

MAINE
University of Maine, *Orono*

MARYLAND
University of Maryland, *College Park*
University of Maryland Eastern Shore, *Princess Anne*

MASSACHUSETTS
University of Massachusetts, *Amherst*

MICHIGAN
Bay Mills Community College, *Brimely*
Keweenaw Bay Ojibwa Community College, *Baraga*
Michigan State University, *East Lansing*
Saginaw Chippewa Tribal College, *Mount Pleasant*

MICRONESIA
College of Micronesia, *Kolonia, Pohnpei*

MINNESOTA
Fond du Lac Tribal & Community College, *Cloquet*
Leech Lake Tribal College, *Cass Lake*
University of Minnesota, *St. Paul*
White Earth Tribal and Community College, *Mahnomen*

MISSISSIPPI
Alcorn State University, *Lorman*
Mississippi State University, *Starkville*

MISSOURI
Lincoln University, *Jefferson City*
University of Missouri, *Columbia*

MONTANA
Blackfeet Community College, *Browning*
Chief Dull Knife College, *Lame Deer*
Aaniiih Nakoda College, *Harlem*
Fort Peck Community College, *Poplar*
Little Big Horn College, *Crow Agency*
Montana State University, *Bozeman*
Salish Kootenai College, *Pablo*
Stone Child College, *Box Elder*

NEBRASKA
Little Priest Tribal College, *Winnebago*
Nebraska Indian Community College, *Winnebago*
University of Nebraska, *Lincoln*

NEVADA
University of Nevada, *Reno*

NEW HAMPSHIRE
University of New Hampshire, *Durham*

NEW JERSEY
Rutgers University, *New Brunswick*

NEW MEXICO
Navajo Technical College, *Crownpoint*
Institute of American Indian and Alaska Native Culture and Arts Development, *Sante Fe*
New Mexico State University, *Las Cruces*
Southwestern Indian Polytechnic Institute, *Albuquerque*

NEW YORK
Cornell University, *Ithaca*

NORTH CAROLINA
North Carolina A&T State University, *Greensboro*
North Carolina State University, *Raleigh*

NORTH DAKOTA
Fort Berthold Community College, *New Town*
Cankdeska Cikana Community College, *Fort Totten*
North Dakota State University, *Fargo*
Sitting Bull College, *Fort Yates*
Turtle Mountain Community College, *Belcourt*
United Tribes Technical College, *Bismarck*

NORTHERN MARIANAS
Northern Marianas College, *Saipan*

OHIO
Central State University, *Wilberforce*
Ohio State University, *Columbus*

OKLAHOMA
College of the Muscogee Nation, *Okmulgee*
Langston University, *Langston*
Oklahoma State University, *Stillwater*

OREGON
Oregon State University, *Corvallis*

PENNSYLVANIA
Pennsylvania State University, *University Park*

PUERTO RICO
University of Puerto Rico, *Mayaguez*

RHODE ISLAND
University of Rhode Island, *Kingston*

SOUTH CAROLINA
Clemson University, *Clemson*
South Carolina State University, *Orangeburg*

SOUTH DAKOTA
Oglala Lakota College, *Kyle*
Si Tanka/Huron University, *Eagle Butte*
Sinte Gleska University, *Rosebud*
Sisseton Wahpeton Community College, *Sisseton*
South Dakota State University, *Brookings*

TENNESSEE
Tennessee State University, *Nashville*
University of Tennessee, *Knoxville*

TEXAS
Prairie View A&M University, *Prairie View*
Texas A&M University, *College Station*

UTAH
Utah State University, *Logan*

VERMONT
University of Vermont, *Burlington*

VIRGIN ISLANDS
University of the Virgin Islands, *St. Croix*

VIRGINIA
Virginia Tech, *Blacksburg*
Virginia State University, *Petersburg*

WASHINGTON
Northwest Indian College, *Bellingham*
Washington State University, *Pullman*

WEST VIRGINIA
West Virginia State University, *Institute*
West Virginia University, *Morgantown*

WISCONSIN
College of Menominee Nation, *Keshena*
Lac Courte Oreilles Ojibwa Community College, *Hayward*
University of Wisconsin, *Madison*

WYOMING
University of Wyoming, *Laramie, WY*

CERTIFIED NON-LAND GRANT COLLEGES OF AGRICULTURE

ALABAMA
University of West Alabama

ARIZONA
Arizona State University

ARKANSAS
Arkansas State University
Arkansas Tech University
Southern Arkansas University

CALIFORNIA
California State Polytechnic University, Pomona
California State University, Bakersfield
California State University, Channel Islands
California State University, Chico
California State University, Fresno
California State University, Monterey Bay
California State University, Northridge
California State University, Stanislaus
California State University, San Francisco
California State University, San Marcos

FLORIDA
College of Central Florida
Florida State University

GEORGIA
Georgia Institute of Technology

ILLINOIS
Illinois State University
Western Illinois University

INDIANA
Ball State University
Indiana State University
Lehman College

KANSAS
Fort Hays State University

KENTUCKY
Eastern Kentucky University
Murray State University
Western Kentucky University

LOUISIANA
The University of Louisiana at Monroe

MAINE
The University of Southern Maine

MARYLAND
University of Maryland, Baltimore County

MICHIGAN
Wayne State University

MINNESOTA
Minnesota State University, *Mankato*
Southwest Minnesota State University

MISSISSIPPI
The University of Southern Mississippi

MISSOURI
Missouri State University
Northwest Missouri State University
Southeast Missouri State University
University of Central Missouri

NEW JERSEY
Montclair State University

NEW YORK
City University of New York, Queens College
State University of New York College of Agriculture and Technology at Cobleskill

NORTH CAROLINA
Appalachian State University
East Carolina University
The University of North Carolina
The University of North Carolina at Chapel Hill
The University of North Carolina–Pembroke

NORTH DAKOTA
Dickinson State University
University of North Dakota–Grand Forks

OHIO
Bowling Green State University
Miami University, *Oxford Ohio*

OKLAHOMA
The University of Central Oklahoma
The University of Oklahoma

OREGON
University of Oregon

PENNSYLVANIA
Bloomsburg University of Pennsylvania

SOUTH CAROLINA
The University of South Carolina

TENNESSEE
Austin Peay State University
Middle Tennessee State University
Tennessee Technological University
The University of Tennessee at Martin
University of Tennessee at Chattanooga

TEXAS
Angelo State University
Sam Houston State University
Sul Ross State University
Tarleton State University
Texas A&M University–Commerce
Texas Southern University
Texas Tech University
The University of Texas at Austin
University of North Texas
West Texas A&M University

UTAH
Southern Utah University

VERMONT
Vermont Technical College–Randolph Center

VIRGINIA
George Mason University
Virginia Institute of Marine Science, Gloucester Point

WISCONSIN
The University of Wisconsin–Platteville
The University of Wisconsin–River Falls
The University of Wisconsin–Stevens Point
The University of Wisconsin–Stout

HISPANIC-SERVING INSTITUTIONS (HSIs)

ARIZONA
Arizona State University, *Downtown Phoenix*
Arizona State University, *West*
Arizona Western College
Central Arizona College
Cochise College*
College America, *Phoenix*
Estrella Mountain Community College
GateWay Community College
Glendale Community College
Phoenix College*
Pima Community College*
South Mountain Community College

CALIFORNIA
Allan Hancock College*
Alliant International University
Antelope Valley College
Antioch University, *Los Angeles*
Azusa Pacific Online University
Bakersfield College*
Barstow Community College
Bethesda University of California
Brandman University
Cabrillo College
California Baptist University
California Christian College
California College San Diego, *National City*
California College San Diego, *San Marcos*
California College San Diego, *San Diego*
California Lutheran University
California State Polytechnic University, *Pomona*
California State University, *Bakersfield*
California State University, *Channel Islands*
California State University, *Dominguez Hills*
California State University, *East Bay*
California State University, *Fresno*
California State University, *Fullerton*
California State University, *Long Beach*
California State University, *Los Angeles*
California State University, *Monterey Bay*
California State University, *Northridge*
California State University, *Sacramento*
California State University, *San Bernardino**
California State University, *San Marcos*
California State University, *Stanislaus*
Canada College
Casa Loma College, *Van Nuys*
CBD College
Cerritos College
Cerro Coso Community College
Chabot College
Chaffey College*
Citrus College
College of San Mateo*
College of the Canyons
College of the Desert*
College of the Sequoias*
Community Christian College
Contra Costa College
Crafton Hills College
Cuesta College
Cuyamaca College
Cypress College
East Los Angeles College
El Camino College, *Compton Center*
El Camino Community College District
Evergreen Valley College
Fresno City College
Fresno Pacific University
Fullerton College*
Gavilan College
Glendale Community College
Golden West College*
Grossmont College
Hartnell College*
Holy Names University
Humboldt State University
Humphreys College, *Stockton & Modesto Campuses*
Imperial Valley College*
La Sierra University
Las Positas College
Loma Linda University
Long Beach City College*
Los Angeles City College*
Los Angeles County College of Nursing and Allied Health
Los Angeles Harbor College
Los Angeles Mission College
Los Angeles Pierce College*
Los Angeles Southwest College
Los Angeles Trade Technical College
Los Angeles Valley College
Los Medanos College
Marymount California University
Mendocino College
Merced College*
Merritt College
MiraCosta College*
Modesto Junior College*
Monterey Peninsula College*
Moorpark College
Moreno Valley College
Mount St. Mary's College
Mt. San Antonio College*
Mt. San Jacinto Community College District*
Napa Valley College
National University
Norco College
Notre Dame de Namur University
Orange Coast College*
Oxnard College
Pacific Oaks College
Pacific Union College
Palo Alto University
Palo Verde College
Palomar College
Pasadena City College
Porterville College*
Reedley College*
Rio Hondo College
Riverside City College
Sacramento City College
Saint Mary's College of California
San Bernardino Valley College
San Diego City College
San Diego Mesa College*
San Diego State University
San Diego State University, *Imperial Valley Campus*
San Joaquin Delta College*
San Jose City College
Santa Ana College*
Santa Barbara City College*

*HSI with Hispanic-Serving Agricultural Colleges and Universities (HSACU) Certification

Santa Monica College
Santa Rosa Junior College
Santiago Canyon College
Skyline College
Solano Community College
Southwestern College*
Taft College
University of California, *Merced*
University of California, *Riverside**
University of California, *Santa Cruz*
University of La Verne
University of the West
Vanguard University of Southern California
Ventura College
Victor Valley College*
West Hills College Coalinga*
West Hills College Lemoore
West Los Angeles College
Whittier College*
Woodbury University
Woodland Community College
Yuba College

COLORADO

Adams State College
Aims Community College
College America, *Denver*
College America, *Fort Collins*
College America, *Colorado Springs South*
Colorado Heights University
Colorado State University, *Pueblo*
Community College of Denver
Otero Junior College
Pueblo Community College
Trinidad State Junior College*

CONNECTICUT

Capital Community College
Housatonic Community College
Norwalk Community College

FLORIDA

Atlantic Institute of Oriental Medicine
Barry University
Broward College
Carlos Albizu University, *Miami*
City College, *Altamonte Springs*
City College, *Hollywood*
City College, *Miami*
Florida International University*
Hillsborough Community College
Hodges University
Keiser University, *Ft Lauderdale*
Miami Dade College*
Nova Southeastern University*
Palm Beach State College
Polytechnic University of Puerto Rico, *Miami*
Polytechnic University of Puerto Rico, *Orlando*
Remington College, *Tampa Campus*
Saber College
Saint John Vianney College Seminary
South Florida State College
Saint Thomas University
Trinity International University, *Florida*
Valencia College

ILLINOIS

City Colleges of Chicago, *Harold Washington College**
City Colleges of Chicago, *Harry S Truman College*
City Colleges of Chicago, *Richard J Daley College*
City Colleges of Chicago, *Wilbur Wright College*
College of Lake County
Dominican University*
Elgin Community College
Lexington College
Morton College
National Louis University
Northeastern Illinois University
Robert Morris University Illinois
Saint Augustine College
Triton College
Waubonsee Community College

INDIANA

Calumet College of Saint Joseph

KANSAS

Dodge City Community College
Donnelly College
Garden City Community College
Northwest Kansas Technical College
Seward County Community College and Area Technical School

LOUISIANA

Saint Joseph Seminary College

MASSACHUSETTS

Northern Essex Community College
Springfield Technical Community College
Urban College of Boston

NEVADA

College of Southern Nevada

NEW JERSEY

Cumberland County College
Essex County College
Fairleigh Dickinson University, *Metropolitan Campus*
Hudson County Community College
Middlesex County College
New Jersey City University
Passaic County Community College
Pillar College
Saint Peter's College
Union County College

NEW MEXICO

Central New Mexico Community College
Clovis Community College
Eastern New Mexico University, *Main Campus**
Eastern New Mexico University, *Roswell Campus*
Eastern New Mexico University, *Ruidoso Campus*
Luna Community College
Mesalands Community College*
New Mexico Highlands University*
New Mexico Institute of Mining and Technology*
New Mexico Junior College
New Mexico State University, *Alamogordo*
New Mexico State University, *Carlsbad*
New Mexico State University, *Dona Ana*
New Mexico State University, *Grants*
New Mexico State University, *Main Campus*
Northern New Mexico College*
Santa Fe Community College*
University of New Mexico, *Los Alamos Campus*
University of New Mexico, *Main Campus**
University of New Mexico, *Taos Campus*
University of New Mexico, *Valencia County Campus*
University of the Southwest
Western New Mexico University*

NEW YORK

Boricua College
College of Mount Saint Vincent
CUNY Borough of Manhattan Community College
CUNY Bronx Community College*
CUNY City College
CUNY Hostos Community College
CUNY John Jay College of Criminal Justice
CUNY LaGuardia Community College*
CUNY Lehman College
CUNY New York City College of Technology
CUNY Queens College
CUNY Queensborough Community College
Dominican College of Blauvelt
Mercy College
Nyack College
Professional Business College
Stella and Charles Guttman Community College
SUNY Westchester Community College*
Vaughn College of Aeronautics and Technology

OHIO

Union Institute & University

OREGON

Mount Angel Seminary

PENNSYLVANIA

Reading Area Community College

PUERTO RICO

American University of Puerto Rico, *Bayamon*
American University of Puerto Rico, *Manati*
Atenas College
Atlantic University College
Bayamon Central University*
Caribbean University, *Bayamon*
Caribbean University, *Carolina*
Caribbean University, *Ponce*
Caribbean University, *Vega Baja*
Carlos Albizu University, *San Juan*
Centro de Estudios Multidisciplinarios, *Bayamon*
Centro de Estudios Multidisciplinarios, *Humacao*
Centro de Estudios Multidisciplinarios, *San Juan*
Colegio Universitario de San Juan
Dewey University, *Hato Rey*
EDP University of Puerto Rico Inc, *San Juan*
EDP University of Puerto Rico Inc, *San Sebastian*
Escuela de Artes Plasticas de Puerto Rico
Humacao Community College
Instituto Tecnologico de Puerto Rico, *Recinto de Guayama*
Instituto Tecnologico de Puerto Rico, *Recinto de Manati**
Instituto Tecnologico de Puerto Rico, *Recinto de Ponce*
Instituto Tecnologico de Puerto Rico, *Recinto de San Juan*
Inter American University of Puerto Rico, *Aguadilla**
Inter American University of Puerto Rico, *Arecibo*
Inter American University of Puerto Rico, *Barranquitas*
Inter American University of Puerto Rico, *Bayamon**
Inter American University of Puerto Rico, *Fajardo*
Inter American University of Puerto Rico, *Guayama*
Inter American University of Puerto Rico, *Metro**
Inter American University of Puerto Rico, *Ponce**
Inter American University of Puerto Rico, *San German**
Pontifical Catholic University of Puerto Rico, *Arecibo*
Pontifical Catholic University of Puerto Rico, *Mayaguez*
Pontifical Catholic University of Puerto Rico, *Ponce**
Puerto Rico Conservatory of Music
San Juan Bautista School of Medicine
Universal Technology College of Puerto Rico
Universidad Adventista de las Antillas
Universidad Central del Caribe
Universidad Del Este
Universidad Del Sagrado Corazon
Universidad Del Turabo*
Universidad Metropolitana*
Universidad Pentecostal Mizpa
Universidad Politecnica de Puerto Rico
Universidad Teologica del Caribe
University of Puerto Rico, *Aguadilla*
University of Puerto Rico, *Arecibo**
University of Puerto Rico, *Bayamon*
University of Puerto Rico, *Carolina*
University of Puerto Rico, *Cayey*
University of Puerto Rico, *Humacao**
University of Puerto Rico, *Mayaguez*
University of Puerto Rico, *Medical Sciences**
University of Puerto Rico, *Ponce*
University of Puerto Rico, *Rio Piedras**
University of Puerto Rico, *Utuado**

TENNESSEE

Mid-South Christian College

TEXAS

Alvin Community College
Amarillo College
Angelo State University
Austin Community College District
Baptist University of the Americas
Brazosport College
Brookhaven College
Coastal Bend College
College of Biblical Studies, *Houston*
College of the Mainland
Del Mar College
Eastfield College
El Centro College
El Paso Community College
Galveston College
Hallmark College
Houston Baptist University
Houston Community College*
Howard College
Jacksonville College, *Main Campus*
Laredo Community College
Lee College*

*HSI with Hispanic-Serving Agricultural Colleges and Universities (HSACU) Certification

Lone Star College System
McLennan Community College
Midland College*
Mountain View College
North Lake College
Northwest Vista College
Northwood University, *Texas*
Odessa College
Our Lady of the Lake University, *San Antonio*
Palo Alto College*
Remington College, *Dallas Campus*
Remington College, *Fort Worth Campus*
Remington College, *Houston Campus*
Remington College, *Houston Southeast Campus*
Remington College, *North Houston Campus*
Richland College*
Saint Edward's University*
San Antonio College*
San Jacinto Community College
Schreiner University
South Plains College
South Texas College
Southwest Collegiate Institute for the Deaf
Southwest Texas Junior College*
Southwestern Adventist University
St. Mary's University*
St. Philip's College
Sul Ross State University
Tarrant County College District
Texas A&M International University, *Laredo**
Texas A&M University, *Corpus Christi**
Texas A&M University, *Kingsville**
Texas Lutheran University
Texas State Technical College, *Harlingen**
Texas State Technical College, *West Texas*
Texas State University*
The University of Texas at Arlington*
The University of Texas at Brownsville*
The University of Texas at El Paso*
The University of Texas at San Antonio*
The University of Texas Health Science Center at San Antonio
The University of Texas of the Permian Basin
The University of Texas, Pan American*
University of Houston*
University of Houston, *Clear Lake*
University of Houston, *Downtown*
University of Houston, *Victoria*
University of St. Thomas
University of the Incarnate Word*
Victoria College
Wayland Baptist College
Western Texas College
Wharton County Junior College

VIRGINIA

Bethel College

WASHINGTON

Big Bend Community College*
Columbia Basin College*
Heritage University
Wenatchee Valley College*
Yakima Valley Community College

*HSI with Hispanic-Serving Agricultural Colleges and Universities (HSACU) Certification

NIFA'S PARTNERS

STATE & FEDERAL:

U.S. Department of Commerce
U.S. Department of Defense
U.S. Department of Energy
U.S. Department of Health and Human Services
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Environmental Protection Agency
Tennessee Valley Authority
National Science Foundation
National Institutes of Health

USDA AGENCIES:

Agricultural Marketing Service
Agricultural Research Service
Food and Nutrition Service
Food Safety and Inspection Service
Foreign Agricultural Service
Forest Service
Natural Resources Conservation Service
Rural Development

OTHER:

Association of Public and Land-grant Universities
Foundation for Food and Agricultural Research
National Agricultural Research, Education, Extension and Economics Advisory Board

THE NUMBERS

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE ($000)

PROGRAMS	FY 2015 CONSOLIDATED APPROPRIATIONS
DISCRETIONARY FUNDING	
Agriculture and Food Research Initiative	$325,000
CAPACITY PROGRAMS:	
Hatch Act	243,701
McIntire-Stennis Cooperative Forestry	33,961
Evans-Allen Program	52,485
Animal Health and Disease, Section 1433	4,000
SPECIAL RESEARCH GRANTS:	
Minor Crop Pest Management, IR-4	11,913
Global Change, UV-B Monitoring	1,405
Potato Research	1,350
Aquaculture Research	1,350
OTHER RESEARCH:	
Aquaculture Centers	4,000
Sustainable Agriculture Research and Education Program	22,667
Supplemental and Alternative Crops	825
1994 Research Grants	1,801
Federal Administration (Direct Appropriation)	20,528
Farm Business Management and Benchmarking Program	1,450
Sun Grant Program	2,500
Capacity Building for Non-Land Grant Colleges of Agriculture	4,500
Alfalfa and Forage Research	1,350
HIGHER EDUCATION:	
Institution Challenge, Multicultural Scholars and Graduate Fellowship Grants	9,000
1890 Institution Capacity Building Grants	19,336
Hispanic-Serving Institutions Education Grants Program	9,219
Tribal Colleges Education Equity Grants Program	3,439
Interest (Estimated) Earned on Tribal Colleges Endowment Fund	5,079
Secondary Education/2-Year Post Secondary	900
Alaska Native-Serving and Native Hawaiian-Serving Institutions	3,194
Veterinary Medical Services Act	5,000
Grants for Insular Areas	2,000
Subtotal a/	791,953
SECTION 406 LEGISLATIVE AUTHORITY:	
Methyl Bromide Transition Program	2,000
Organic Transition Program	4,000
Crop Protection/Pest Management	17,200
OTHER LEGISLATIVE AUTHORITIES:	
Regional Rural Development Centers	1,000
Food and Agriculture Defense Initiative	6,700
Subtotal	30,900

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE ($000)

PROGRAMS	FY 2015 CONSOLIDATED APPROPRIATIONS
CAPACITY PROGRAMS:	
Smith-Lever Formula 3(b)&(c)	$300,000
1890 Institutions Extension	43,920
SMITH-LEVER 3(D) PROGRAMS:	
Expanded Food and Nutrition Education Program	67,934
Farm Safety and Youth Farm Safety Education and Certification	4,610
New Technologies for Agricultural Extension	1,550
Children, Youth, and Families at Risk	8,395
Federally-Recognized Tribes Extension Program	3,039
OTHER EXTENSION PROGRAMS:	
Extension Services at 1994 Institutions	4,446
Renewable Resources Extension Act	4,060
Rural Health and Safety	1,500
1890 Facilities (Section 1447)	19,730
Food Animal Residue Avoidance Database Program (FARAD)	1,250
Women and Minorities in Science, Technology, Engineering and Mathematics (STEM) Fields	400
Food Safety Outreach Program	2,500
Federal Administration b/	8,357
Subtotal	471,691
TOTAL, DISCRETIONARY FUNDING A/	1,294,544
MANDATORY AND ENDOWMENT FUNDING	
Tribal Colleges Endowment Fund	11,880
Organic Agriculture Research and Extension Initiative	18,540
Beginning Farmers and Ranchers Development Program	18,540
Biomass Research and Development Initiative (BRDI)	2,781
Specialty Crop Research Initiative	50,985
Emergency Citrus Research and Extension Program	23,175
Biodiesel Fuel Education Program c/	927
Agriculture Risk Management Education Program c/	4,635
Community Food Projects Competitive Grants Program c/	9,000
TOTAL, MANDATORY AND ENDOWMENT FUNDING D/	140,463
TOTAL, DISCRETIONARY AND MANDATORY FUNDING A/D/	1,435,007

NOTES:

a/ Estimated interest on Tribal College Endowment Fund is included in the total.
b/ In FY 2015 appropriations, $552,000 is provided within the total for Agriculture in the Classroom (AITC).
c/ Mandatory program delegated to another USDA agency but administered by NIFA.
d/ Farm Bill funding amounts are based on H.R. 2642, the Agricultural Act of 2014 and include impact of sequestration of mandatory funds in FY 2015.

STATES AWARD STATISTICS FOR FISCAL YEAR 2015 NON-FORMULA AWARDS

PERFORMING ORGANIZATION	NUMBER OF AWARDS	TOTAL FUNDING	% PER NUMBER	% PER FUNDING
1862 Land-Grant University	831	$461,213,024	58.7%	69.0%
1890 Land-Grant University	91	42,114,856	6.4%	6.3%
1994 Land-Grant University	98	10,663,541	6.9%	2.0%
Non Land-Grant Public University or College	75	26,802,755	5.3%	4.0%
Other	5	3,727,560	0.4%	0.6%
Private for Profit	118	22,689,582	8.3%	3.0%
Private Nonprofit	125	56,450,369	8.8%	8.0%
Private University/College	39	19,805,913	2.8%	3.0%
State, Local, or Tribal Government	15	11,688,160	1.1%	1.7%
USDA Agency	18	14,197,599	1.3%	2.1%
	1,415	$669,353,359	100%	100%

STATES AWARD STATISTICS FOR FISCAL YEAR 2015 FORMULA AWARDS

PERFORMING ORGANIZATION	NUMBER OF AWARDS	TOTAL FUNDING	% PER NUMBER	% PER FUNDING
1862 Land-Grant University*	944	$614,137,957	81.2%	85.6%
1890 Land-Grant University	169	92,309,703	14.5%	12.9%
1994 Land-Grant University	0	0	0.0%	0.0%
Non Land-Grant Public University or College	22	4,902,299	1.9%	0.7%
Other	7	1,368,803	0.6%	0.2%
Other Federal Agency	0	0	0.0%	0.0%
Private for Profit	0	0	0.0%	0.0%
Private Nonprofit	0	0	0.0%	0.0%
Private University/College**	15	3,843,633	1.3%	0.5%
Public Secondary School	0	0	0.0%	0.0%
State, Local, or Tribal Government	6	1,298,280	0.5%	0.2%
USDA Agency	0	0	0.0%	0.0%
	1163	$717,860,675	100%	100%

* *Total count and dollar amount includes 1 project (2014-36100-05148) that may not be extracted when preparing general reports generated through the Snapshot and some Discoverer reports.*

** *Includes project 2012-41510-20085 supported with formula funds but processed as a non-formula project.*

OUR LEADERSHIP AND ORGANIZATION

OUR LEADERSHIP

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ASSOCIATE DIRECTOR FOR PROGRAMS
Dr. Meryl Broussard

ASSOCIATE DIRECTOR FOR OPERATIONS
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OFFICE OF GRANTS AND FINANCIAL MANAGEMENT
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OFFICE OF INFORMATION TECHNOLOGY
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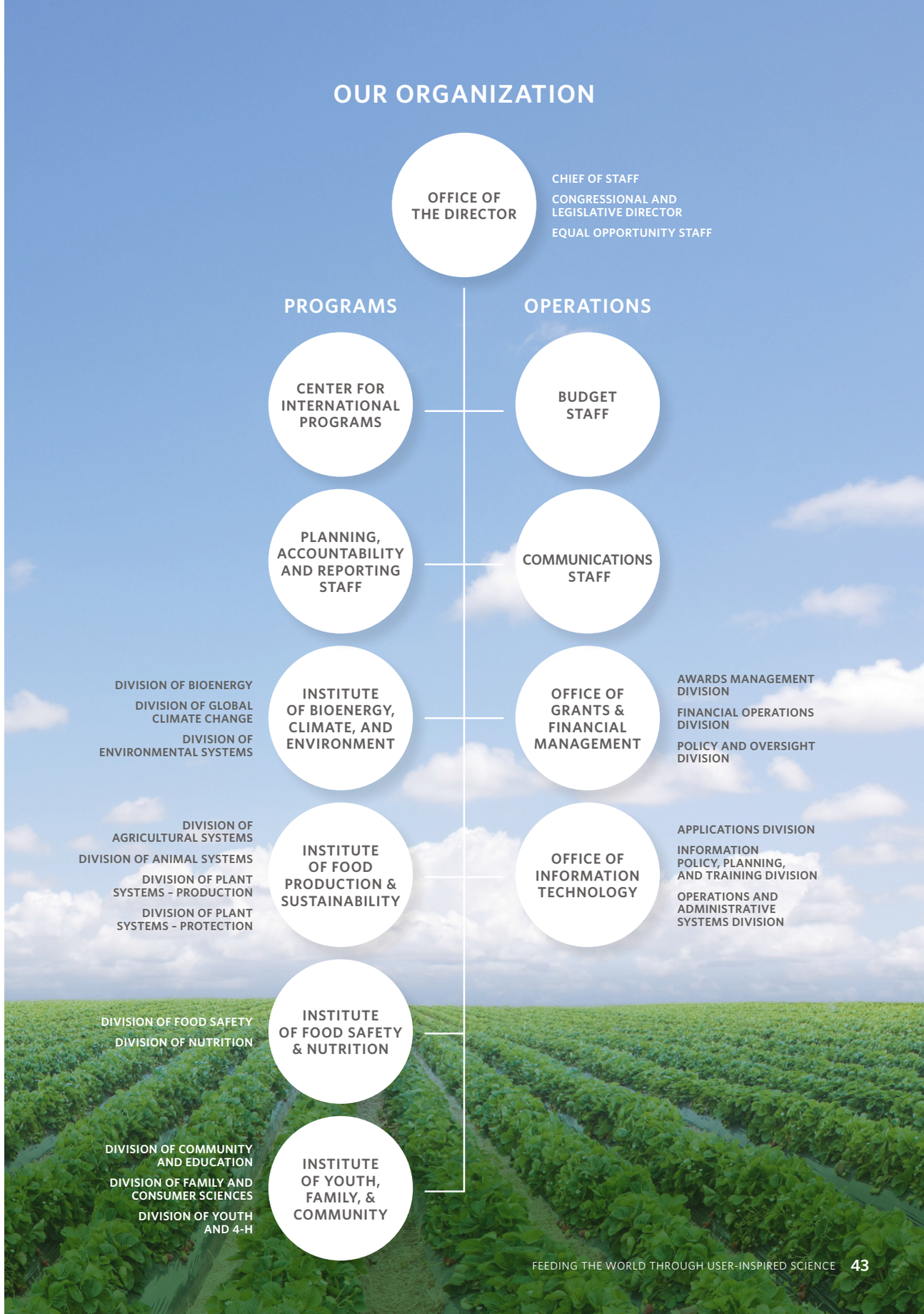
Barton Hewitt

EQUAL OPPORTUNITY STAFF
Curtland Deville

BUDGET STAFF
Paula Geiger

COMMUNICATIONS STAFF
Virginia Bueno

OUR ORGANIZATION



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