



United States Department of Agriculture



NATIONAL INSTITUTE OF FOOD AND AGRICULTURE | [WWW.NIFA.USDA.GOV](http://WWW.NIFA.USDA.GOV)

# THE 2008 FARM BILL MAKING AN IMPACT THROUGH NIFA



INVESTING IN:  
**PLANT RESEARCH**



SECURING:  
**AMERICAN JOBS**

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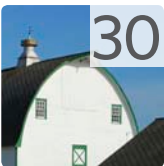
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# THE 2008 FARM BILL Making an Impact Through NIFA



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# NIFA

**T**HE U.S. DEPARTMENT OF AGRICULTURE'S (USDA) NATIONAL INSTITUTE OF FOOD AND AGRICULTURE (NIFA) was established by the Food Conservation and Energy Act of 2008 (the 2008 Farm Bill) to find innovative solutions to issues related to agriculture, food, the environment, and communities. The agency works with other government agencies, industry, and academia to lead research, education, and Cooperative Extension activities. The work that NIFA supports is part of a dynamic system that moves science from labs to farm and classroom, to dining table, and back again.

NIFA's portfolio of programs includes competitive and capacity-building programs to land-grant institutions and other organizations. NIFA is committed to advancing the food, agricultural, natural resource, and human sciences to create a better future for the nation and the world and values programs that are specifically for underrepresented populations. NIFA provides national leadership to help identify and meet research, education, and extension priorities that include scientific advancements in:

- Plant health, production, and plant products;
- Animal health, production, and animal products;
- Food safety, nutrition, and health;
- Renewable energy, natural resources, and environment;
- Agricultural systems and technology; and
- Agricultural economics and rural communities.

As NIFA supports research, education, and extension advancements, the agency focuses on making large-scale investments that stand to make an impact on societal challenges, thus:

- Keeping American agriculture secure, competitive, and sustainable;
- Improving nutrition and preventing childhood obesity;
- Improving food safety for all Americans;
- Securing America's energy future through the development of bioenergy/biofuels and biobased products; and
- Mitigating and adapting to climate change.

By making the right investments in science at the right time, NIFA enables the scientific community to make great discoveries, helps turn discovery into innovation, and encourages meaningful solutions that improve the food and agriculture sector, the environment, and the quality of people's lives in the United States.

NIFA PARTNERSHIPS

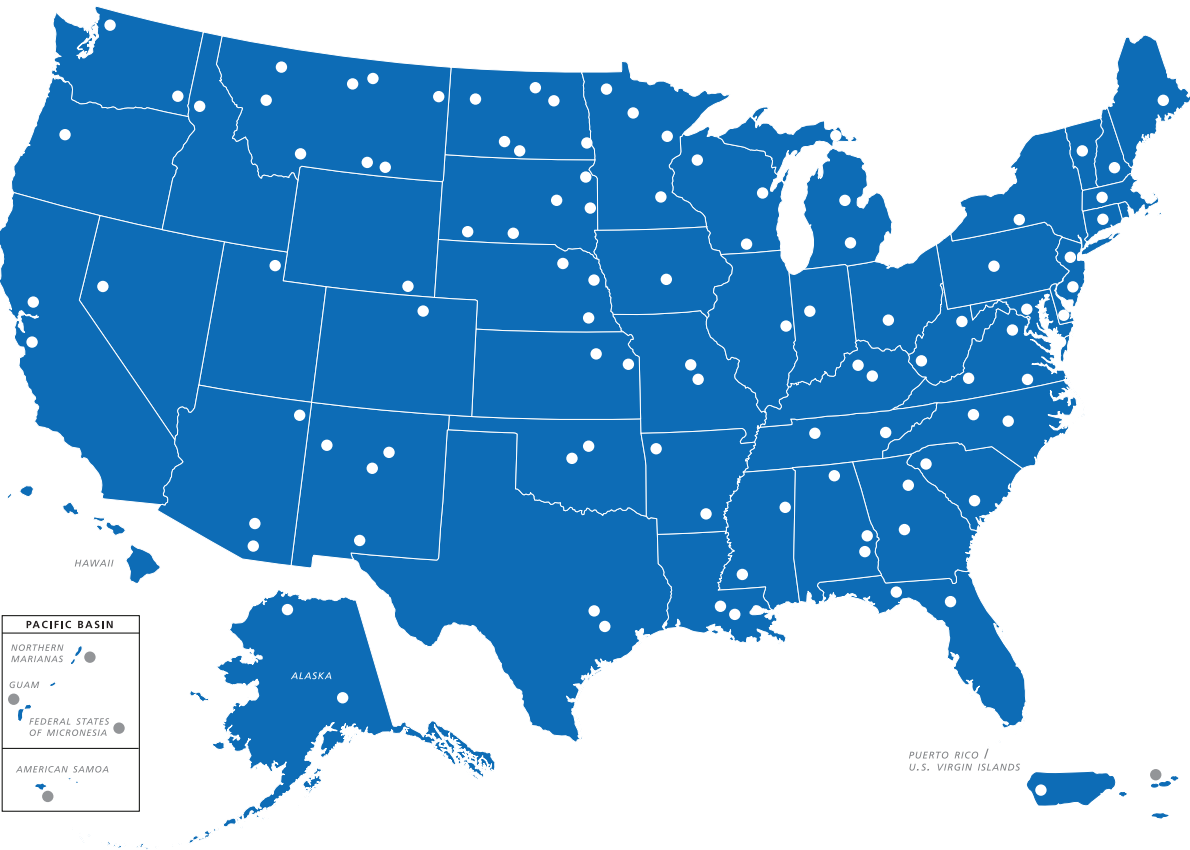
**PARTNERSHIPS ARE INTEGRAL** to NIFA’s mission. NIFA is the federal partner in a vast network of scientists, educators, and extension staff and volunteers who carry out programs in the United States, its territories, and beyond.

NIFA’s partners include land-grant universities (LGU) and colleges, other federal agencies, private organizations, non-land-grant Agriculture and Renewable Resources Universities, **63** schools of forestry, **27** colleges of veterinary medicine, **42** schools and colleges of family and consumer sciences, **17** Alaskan Native-serving and Hawaiian Native-serving institutions, and more than **160** Hispanic-serving institutions.

The LGUs are located in each U.S. state, territory, and in the District of Columbia. The

following map shows the land-grant institutions in each state or territory that host the State Agricultural Experiment Stations ● (1862 land-grants), **18** historically Black LGUs ★ (1890 land-grants), and **34** Native American land-grant colleges ■ (1994 land-grants). All of these institutions conduct agricultural research, educate the current and future food and agriculture sector workforce, and work together with state, local, and/or tribal governments to host the Cooperative Extension System (extension).

DISTRIBUTION OF LAND-GRANT 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
  - 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, Mahanomen

**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 Arts, 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, MP

**OHIO**

  - Ohio State University, Columbus

**OKLAHOMA**

  - ★ 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

NIFA GRANTS TO U.S. STATES AND TERRITORIES

FROM 2008 TO 2012, NIFA received appropriated, mandatory, and endowment funding for dozens of different programs that perform one or more of the following functions:

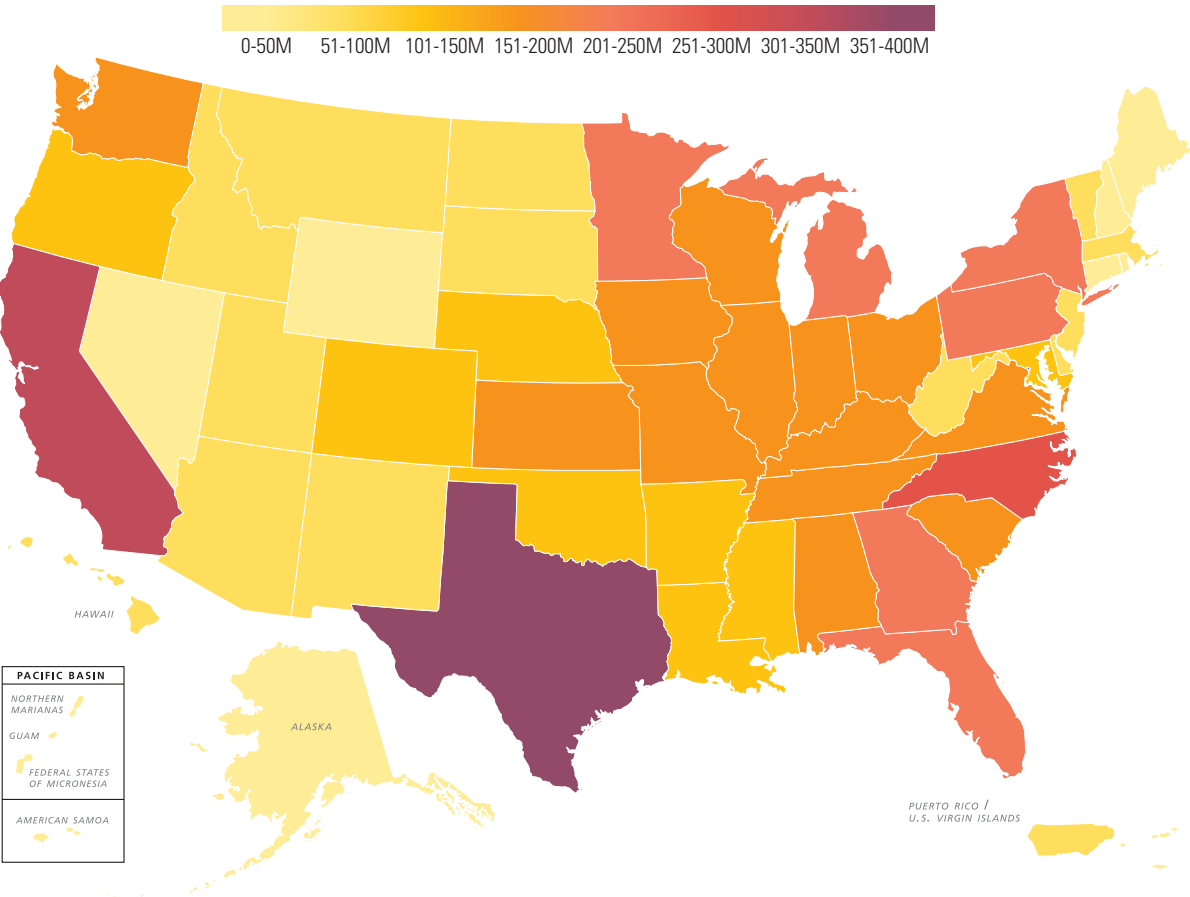
**CAPACITY-BUILDING PROGRAMS FOR STATE AGRICULTURAL EXPERIMENT STATIONS, 1890 RESEARCH, SCHOOLS OF FORESTRY, AND EXTENSION**  
The United States is a superpower in agricultural sciences. These programs ensure that the Land-Grant University System maintains the capacity to conduct research and extension activities. University leaders decide which specific projects an institution's capacity-building grant allotment will support. These decisions are informed, in part, by stakeholders who both conduct and use agricultural research and extension.

**COMPETITIVE RESEARCH, EDUCATION, AND EXTENSION PROGRAMS**  
NIFA awards competitive grants for fundamental and applied research, extension, and higher education activities, and for projects integrating research, education, and extension functions. Competitive programs attract a large pool of applicants to work on agricultural issues of national interest.

**ADDITIONAL PROGRAMS TARGETING MINORITY-SERVING INSTITUTIONS**  
Minority-serving institutions participate in many capacity and competitive research, education, and extension programs. However, some programs are targeted specifically to minority-serving colleges and universities.

NIFA partners leveraged agency research capacity-building programs with more than **\$1 billion** in industry grants and agreements from 2008 through 2011!

FY08-12 TOTAL AWARD DISTRIBUTION (IN MILLIONS)



FY08-12 TOTAL AWARDS (IN MILLIONS) BY STATE/TERRITORY

|                                |         |                |         |                            |        |
|--------------------------------|---------|----------------|---------|----------------------------|--------|
| ALABAMA                        | \$178.4 | KANSAS         | \$183.0 | NORTHERN MARIANA ISLANDS   | \$12.1 |
| ALASKA                         | 34.6    | KENTUCKY       | 162.5   | OHIO                       | 187.8  |
| AMERICAN SAMOA                 | 9.9     | LOUISIANA      | 119.3   | OKLAHOMA                   | 116.3  |
| ARIZONA                        | 75.1    | MAINE          | 45.5    | OREGON                     | 102.9  |
| ARKANSAS                       | 131.7   | MARYLAND       | 134.7   | PENNSYLVANIA               | 221.5  |
| CALIFORNIA                     | 324.1   | MASSACHUSETTS  | 75.0    | PUERTO RICO                | 69.6   |
| COLORADO                       | 100.7   | MICHIGAN       | 205.6   | RHODE ISLAND               | 27.9   |
| CONNECTICUT                    | 46.2    | MINNESOTA      | 230.3   | SOUTH CAROLINA             | 109.1  |
| DELAWARE                       | 61.5    | MISSISSIPPI    | 106.9   | SOUTH DAKOTA               | 64.1   |
| DISTRICT OF COLUMBIA           | 28.8    | MISSOURI       | 165.8   | TENNESSEE                  | 165.3  |
| FEDERATED STATES OF MICRONESIA | 7.5     | MONTANA        | 71.8    | TEXAS                      | 352.6  |
| FLORIDA                        | 207.9   | NEBRASKA       | 117.8   | UTAH                       | 74.2   |
| GEORGIA                        | 203.6   | NEVADA         | 24.6    | VERMONT                    | 56.1   |
| GUAM                           | 16.1    | NEW HAMPSHIRE  | 31.8    | VIRGIN ISLANDS OF THE U.S. | 13.1   |
| HAWAII                         | 80.5    | NEW JERSEY     | 88.5    | VIRGINIA                   | 159.5  |
| IDAHO                          | 64.6    | NEW MEXICO     | 51.1    | WASHINGTON                 | 190.2  |
| ILLINOIS                       | 187.1   | NEW YORK       | 228.1   | WEST VIRGINIA              | 84.6   |
| INDIANA                        | 150.1   | NORTH CAROLINA | 253.3   | WISCONSIN                  | 165.7  |
| IOWA                           | 186.9   | NORTH DAKOTA   | 56.0    | WYOMING                    | 31.6   |

\* Reflects USDA NIFA grant obligations made to each state between October 1, 2007, and September 31, 2012. Source: NIFA Cooperative Research Extension Education Management System grants management internal database as accessed by the NIFA Leadership Management Dashboard.

|  |   |
|--|---|
|  | PLANT BREEDING,<br>GENETICS, AND GENOMICS |
|  | BIOBASED PRODUCTS<br>AND PROCESSING       |
|  | HORTICULTURE                              |
|  | AGRONOMY AND<br>FORAGE CROPS              |
|  | CROP PROTECTION/<br>PEST MANAGEMENT       |
| PLANT HEALTH,<br>PRODUCTION,<br>AND PRODUCTS               | ANIMAL BREEDING<br>AND GENOMICS           |
|  | ANIMAL HEALTH                             |
| ANIMAL HEALTH,<br>PRODUCTION,<br>AND PRODUCTS              | ANIMAL NUTRITION<br>AND GROWTH            |
|  | ANIMAL PRODUCTS                           |
|  | ANIMAL REPRODUCTION                       |
|  | ANIMAL WELL-BEING                         |
|  | AQUACULTURE                               |
| FOOD SAFETY,<br>NUTRITION, AND HEALTH                      | FOOD SAFETY                               |
|  | NUTRITION                                 |
|  | HEALTH AND WELLNESS                       |
| RENEWABLE ENERGY,<br>NATURAL RESOURCES,<br>AND ENVIRONMENT | HUNGER AND FOOD SECURITY                  |
|  | OBESITY AND<br>HEALTHY WEIGHT             |
|  | AIR QUALITY                               |
| AGRICULTURAL SYSTEMS<br>AND TECHNOLOGY                     | SOIL QUALITY                              |
|  | CLIMATE EFFECTS ON AGRICULTURE            |
|  | RENEWABLE ENERGY                          |
| AGRICULTURAL ECONOMICS<br>AND RURAL COMMUNITIES            | WILDLIFE AND FISH                         |
|  | MANURE AND<br>NUTRIENT MANAGEMENT         |
|  | ORGANIC AGRICULTURE                       |
|  | FARM SAFETY                               |
|  | TECHNOLOGY                                |
|  | FARM FINANCIAL MANAGEMENT                 |
|  | FINANCIAL SECURITY                        |
|  | MARKETS, TRADE, AND POLICY                |
|  | RURAL AND COMMUNITY<br>DEVELOPMENT        |

## NIFA's Portfolio

NIFA's portfolio of competitive and capacity-building programs includes thousands of research, education, and extension projects. Information on these projects is available on the Research, Education, and Economics Information System (REEIS) at [www.reeis.usda.gov](http://www.reeis.usda.gov). The following examples represent just a portion of the billions of dollars NIFA has invested in science to secure America's future.

**NIFA | INVESTING IN SCIENCE | SECURING OUR FUTURE**

## INVESTING IN

# Plant Health, Production, and Products

PLANT BREEDING, GENETICS, AND GENOMICS  
BIOBASED PRODUCTS AND PROCESSING  
HORTICULTURE • AGRONOMY AND FORAGE CROPS  
CROP PROTECTION/PEST MANAGEMENT

**W**HEN MOST AMERICANS THINK OF FARMING, they think of growing plants. Whether they get their hands dirty in backyard or urban gardens, buy local goods at a farmers market, or shop for fruits and vegetables at a supermarket, there's a good chance that NIFA's plant science programs have touched their lives. NIFA-funded plant and plant product programs provide better understanding of plants: how they grow, how to improve productivity, and how to use them in new ways. These programs reflect the diversity of plants and their uses around the world. NIFA also supports education programs, such as Master Gardeners and the eXtension program, which bring science-based information about growing plants to the public.

### NIFA'S PLANT HEALTH, PRODUCTION, AND PRODUCTS PORTFOLIO INCLUDES:

#### PLANT BREEDING, GENETICS, AND GENOMICS:

Genetics and genomics tools are improving the effectiveness and efficiency of plant breeding. NIFA-funded projects protect and sustain plants for agriculture and the environment.

#### BIOBASED PRODUCTS AND PROCESSING:

Agricultural and forestry products—both raw material and waste—are the new frontier for producing biofuels. NIFA supports projects that develop and improve the quality and use of biobased products.

**HORTICULTURE:** NIFA-funded programs focus on issues that affect the breeding, growth, production, storage, handling, and marketing of horticultural products—which range from vegetables; to fruits, nuts, and berries; to flowers, nursery, and greenhouse plants.

#### AGRONOMY AND FORAGE CROPS:

Advances in plant and soil sciences improve the productivity of field and forage crops. In addition, these programs ensure wise use of natural resources, reduce soil erosion, and improve soil quality.

#### CROP PROTECTION/PEST MANAGEMENT:

Integrated pest management (IPM) strategies reduce losses caused by insects, diseases, and weeds. NIFA-funded research, education, and extension programs develop IPM approaches such as plant protection tactics and tools, diversified IPM systems, enhanced agricultural biosecurity, IPM for sustainable communities, and preparing the next generation of IPM scientists.



### SECURING OUR FUTURE IN PLANT HEALTH, PRODUCTION, AND PRODUCTS



#### ARKANSAS PROGRAM IMPROVES CORN YIELD

With increases in acreage and the number of producers growing corn in Arkansas (many for the first time), county extension agents have turned to the Arkansas Corn Research Verification program to educate producers about up-to-date management practices for growing profitable corn. The program takes **University of Arkansas**-generated research on hybrid selection, fertility management, pest control, and irrigation management and demonstrates it on a whole-field basis. Yields for program participants averaged over 180 bu/acre, well above the state average corn yield of 142 bu/acre. Those extra 38 bu/acre amounted to an increase of \$247/acre gain in gross revenue compared to state average fields.

#### AFRI-FUNDED PLANT BREEDING AND GENETICS PROJECTS PRODUCE RESULTS

NIFA's Agriculture and Food Research Initiative (AFRI) places a high priority on conventional plant breeding, plant genome structure and function, and other science that improves plant material. From 2008-2012, 20 AFRI-funded Plant Genetics and Genomics Coordinated Agricultural Projects (CAP) have developed 45 bean, potato, tomato, wheat, and barley cultivars and improved over 130 lines; received 27 patents; provided training to 208 undergraduate and 172 graduate students; and spread the word of their research through workshops, webinars, 171 publications, and Web-based outreach materials that have been accessed over 374,500 times.

From 2008 to 2012, 20 AFRI-funded plant-science CAP grants have created webinars, training modules, & other multimedia that have been accessed more than **374,500 times** as of Spring 2013.

## SECURING OUR FUTURE IN PLANT HEALTH, PRODUCTION, AND PRODUCTS



### UNIVERSITY OF FLORIDA DEVELOPS DECISION-MANAGEMENT TOOL FOR SUSTAINABLE STRAWBERRY PRODUCTION

Rainfall can cause fruit rot fungal spores to splash onto strawberries, which creates the need for fungicide applications. However, heavy use of these products has resulted in the development of fungicide resistance. This resistance, when combined with an increase in demand for organically grown crops, threatens the sustainability of strawberry production in the Eastern United States, where consumer demand is high. A team of researchers and extension specialists led by scientists from the **University of Florida** has developed a Web-based disease forecast system that provides recommendations to help strawberry growers know exactly when to apply reduced-risk fungicides. This system has allowed growers to reduce fungicide applications by 50 percent, achieve maximum fruit rot reduction, and increase fruit quality and profit. The resistance monitoring system will allow experts to recommend fungicides that will be effective against particular fruit rot-causing organisms.

Investing in research at University of Florida has resulted in scientists discovering ways to reduce fungicide applications on strawberries by **50%**, increasing fruit quality and profit!

### SBIR-FUNDED INVENTION HELPS DROUGHT-AFFECTED GROWERS

Last year's severe drought increased the amount of nitrates in plants to potentially toxic levels and had farmers wondering if they could safely feed stressed hay and silage to their livestock. Feed with high nitrate can cause nitrate poisoning in livestock, which prevents the bloodstream from transporting oxygen. The result was a large increase in demand for forage test kits that test whether feed is safe for livestock. The Nitrate Elimination Company, Inc. (NECi), received NIFA Small Business Innovation Research (SBIR) grants to develop a new type of environmentally friendly nitrate test kit. Compared to traditional cadmium-based test kits, NECi test



kits are less expensive, just as sensitive, and more selective with fewer substances interfering with the tests. The U.S. Geological Survey has approved the kits for measuring nitrate in solids and water; later this year, the U.S. Environmental Protection Agency is expected to approve the test kits, which will open up new markets worldwide. NECi is located in a rural, economically depressed area of **Michigan**. The company employs 10 people and subcontracts work to local businesses. Sales have increased each year and are expected to grow significantly in the next few years.



### ONION AND GARLIC GROWERS BENEFIT FROM PEST MANAGEMENT SOFTWARE

Onion and garlic production is a billion-dollar-per-year industry in the United States and one where even small improvements can have a big payoff to producers. A team of researchers and extension specialists led by **Colorado State University** developed online software that enables onion and garlic growers to make timely, smarter, and more economically beneficial integrated pest management decisions. The software combines pest scouting information, weather, plant growth stage, pest and disease thresholds, and economic market monitoring to improve growers' production and integrated pest management decisionmaking. A profitability estimate predicts a 50-to-1 annual return for the original research and extension investment.

### CALIFORNIA-LED PROGRAM IMPROVES WHEAT AND BARLEY BREEDING

A 21-state CAP is targeting breeding for the sustainable agricultural production of wheat and barley at the national level. Led by the **University of California-Davis**, the project's 200 scientists, technical staff, and students have generated an integrated network of public wheat and barley breeding programs to increase yields, end-use quality, and adaptation to climate change; to improve varieties; and to better disease and insect resistance. Through investigative research, U.S. wheat and barley breeders have released 14 new varieties, 12 new improved germplasm, and 2 mapping populations and characterized tens of thousands of breeding lines by using molecular markers suited to changing conditions

### ORGANIC GROWERS RECEIVE CONTRACTING HELP

Until now, organic farmers had little independent, reliable legal information to help them with contracts for their organic farm products. The **Minnesota**-based Farmers' Legal Action Group addressed this problem by releasing a comprehensive publication, the Farmers' Guide to Organic Contracts. This farmer-friendly legal guide—the direct result of a NIFA Organic Agriculture Research and Extension Initiative grant—will help the nation's nearly 30,000 certified organic farmers as they evaluate, negotiate, and manage contract agreements with buyers of organic farm products.



### IOWA STATE UNIVERSITY SCIENTISTS CLOSE IN ON PLANT DISEASE PREDICTABILITY

**Iowa State University** (ISU) scientists are working to improve our ability to predict, and even prevent, disease outbreaks by better understanding the behavior of pathogens in and on plants. Until recently, scientists did not know much about the lives of bacteria on the surface or inside of leaves. In this study, researchers learned that bacteria on leaf surfaces degrade an amino acid that is necessary for plants to defend themselves against invading pathogens. Results of this project will support the development of recommended management and treatment practices for plant disease control.

## INVESTING IN

# Animal Health, Production, and Products

ANIMAL BREEDING AND GENOMICS  
ANIMAL HEALTH • ANIMAL NUTRITION & GROWTH  
ANIMAL PRODUCTS • ANIMAL REPRODUCTION  
ANIMAL WELL-BEING • AQUACULTURE

**A**NIMALS ARE ONE OF THE MOST IMPORTANT ASPECTS of agriculture in America. Since the 2008 Farm Bill was signed, NIFA's investments in animal science have found new and better ways to advance animal production technology, enable the industry to respond to consumer demand, and advance human health and nutrition through better animal health and breeding. NIFA's animal-related programs—which include beef, dairy cattle, poultry, swine, sheep, goats, and aquaculture—encourage a multidisciplinary approach to research, education, and extension activities.

### NIFA'S ANIMAL HEALTH, PRODUCTION, AND PRODUCTS PORTFOLIO INCLUDES:

#### ANIMAL BREEDING AND GENOMICS:

NIFA-funded projects focus on understanding how the interaction of genes and environment affect animal health, growth, productivity, and well-being.

**ANIMAL HEALTH:** NIFA's unique role in the fight against animal disease includes providing funds to partners who conduct small-scale research to respond to disease outbreaks; stimulating interstate cooperation; targeting diseases of national, state, and regional importance; and disseminating animal health information.

#### ANIMAL NUTRITION AND GROWTH:

If an animal receives too few nutrients in its diet, the result can be poor growth and health; however, too much can lead to environmental damage in the form

of odor and water pollution through nutrient runoff. NIFA-funded projects investigate the nutritional, biological, and genetic factors of animal growth, development, and nutrient digestion.

**ANIMAL PRODUCTS:** Many elements affect the quality and safety of animal products. The projects that our partners undertake examine processing, technology, marketing, and value-added products.

**ANIMAL REPRODUCTION:** Effective breeding affects the profitability of many animal production systems. These projects conduct basic and applied research to control animal reproductive efficiency and educate livestock and poultry producers. >>



**ANIMAL WELL-BEING:** NIFA works with scientists, industry, and animal welfare groups to identify and address animal well-being issues, such as farm animal health, transportation, harvest environment, and biosecurity.

**AQUACULTURE:** Rearing fish and other aquatic animals for food is big business in the United States. NIFA provides leadership for aquaculture research and technology development as a means to advance the U.S. aquaculture industry.

### SECURING OUR FUTURE IN ANIMAL HEALTH, PRODUCTION, AND PRODUCTS

#### CONCENTRATED CALVING SAVES MONEY FOR FLORIDA RANCHERS

**University of Florida** researchers have discovered that they can reduce costs and increase profits for the beef producers if a higher percentage of cows calve during a more concentrated timeframe and earlier in the calving period. Integrating reproductive management technologies into management systems shows that it costs 75 cents to \$1.50 per day to raise one post-weaned calf, and 70 percent of that cost is feed-related. Cattle producers who feed specific supplements can save \$3.65 to \$9.24 per head during the backgrounding phase (90 to 120 days). Statewide, the Florida cattle industry can save \$1.9 to \$7 million each year.

#### NEW BREEDING TECHNOLOGY IMPROVES DAIRY INDUSTRY

For over 50 years, American dairy farmers have used selective breeding to produce dairy cows that produce more milk. The problem with this expensive process is that it takes about 5 years to “progeny” test a bull, but other breeding techniques were less reliable in their ability to pass on desired genetic traits. A team of NIFA-funded scientists from USDA's Agricultural Research Service (ARS), LGUs, and the dairy industry have developed a new genetic test (a genotyping assay) that can assess an animal immediately after birth. About 10,000 animals were genotyped, and researchers used the data to develop a new breeding selection method called genome selection. The genome selection method simultaneously reduced animal selection time (from 5 years to 1 week) and increased prediction accuracy by more than 30 percent for most traits. >>

## SECURING OUR FUTURE THROUGH ANIMAL HEALTH, PRODUCTION, AND PRODUCTS



(continued from previous page)

The dairy industry quickly adopted this technology and has since genotyped more than 500,000 dairy cattle for estimated annual benefits of \$100 million per year. Success in this **Maryland**-based program has led to projects that aim to develop similar genotyping assays for beef cattle.

### PROGRAM HELPS VETERINARIANS PAY BACK COLLEGE TUITION

The Veterinary Medicine Loan Repayment Program (VMLRP) helps large animal veterinarians pay back college tuition. Under VMLRP, veterinarians are encouraged to serve for 3 years in designated areas of the nation that are hampered by a shortage of food-supply sector veterinarians. Those who enter the program receive up to \$25,000 per year to help repay the educational debt they incurred in veterinary school—which averages \$140,000. The growing shortage of food-supply veterinarians is a threat to agricultural animal health and well-being, agro-security, human public health, food inspection/food safety, and the rural animal agriculture economy at large. In its first 3 years, VMLRP has placed over 170 highly qualified veterinarians in prioritized shortage areas. The program is highly competitive, as shown by an application success rate of roughly 30 percent.

### MISSOURI RESEARCH LOOKS TO BREATHE FRESH AIR INTO CATTLE OPERATIONS

Concentrated animal feeding operations (CAFO) are an important economic force in rural areas, bringing an estimated \$1.1 billion annually to northwest **Missouri** alone. However, odor from these facilities has a significant negative impact on neighboring property owners and residents. University of Missouri researchers are working to develop effective biofilters that producers can use to filter out and break down compounds that create strong odors. In addition, they developed a computer model that allows large producers to inexpensively estimate the extent of gas emissions from their operations. Developing technologies will help CAFOs become better neighbors and allow rural regions in northwest Missouri to benefit economically without sacrificing air quality.



### IOWA STATE UNIVERSITY RESEARCHERS WORK TO TAKE THE HEAT OFF SWINE

NIFA awarded a 5-year project to investigate how heat stress affects a pig's metabolism and performance. Heat stress is one of the costliest issues in the U.S. pork industry. Researchers at **ISU** are investigating how heat stress can influence a pig's fetal development and postnatal life, including the ability to develop and grow. The knowledge this study provides will become increasingly valuable as producers work to mitigate severe summer temperatures.



### COORDINATED AG PROJECT IMPROVES POULTRY HEALTH

Highly pathogenic avian flu viruses pose a constant threat to both human health and poultry well-being, but stronger biosecurity measures keep influenza out of poultry flocks and away from people. With NIFA funding, a group of universities led by the **University of Maryland** and scientists from USDA developed new tools that help better prevent, control, and manage future outbreaks of avian flu in the United States. Through this collaboration, partners have developed educational material to help people better understand avian flu and its affect on both poultry and human health.

Highlights of the project include:

- eXtension online training modules for three different audiences—backyard flock owners, youth and 4-H members, and emergency responders—to improve bird flu biosecurity;
- A 4-day certificate course that trains industry, state, and federal responders how to control catastrophic disease outbreaks;
- A poultry handling and transportation quality assurance program;
- Instructions on how to kill flu virus on equipment used during emergency responses; and
- Commercialization of two rapid detection tests that are used worldwide to quickly test whether birds have avian flu.

### UNIVERSITY OF MASSACHUSETTS LEADS U.S. VETERINARY IMMUNE REAGENT NETWORK

Just as you cannot effectively repair a car without proper tools, animal diseases cannot be studied well without particular products, known as immune reagents. **University of Massachusetts-Amherst** leads a public-private partnership that links four academic institutions with three federal laboratories and one private company to form the U.S. Veterinary Immune Reagent Network. The network now offers over 20 new, low-cost commercial tools to animal disease researchers to speed the development of new vaccines, diagnostic tests, and the identification of better intervention approaches to improve animal health and animal welfare. The network will serve to enhance the safety of the nation's agriculture and food supply through improved animal disease control.

### KENTUCKY-LED NATIONAL PROJECT HELPS COMMUNITIES WITH AGROSECURITY PLANNING

The NIFA-funded Extension Disaster Education Network (EDEN) helps local governments respond to agricultural disasters at county and state levels. One of EDEN's many Cooperative Extension programs, "Strengthening Community Agrosecurity Planning," helps build a community's capacity to handle agricultural issues during an emergency by improving networking among responders and establishing or enhancing the agrosecurity components of local emergency operations plans. The **University of Kentucky**-led program trained over 1,100 people (who serve more than 16 million county residents) at 24 workshops in 20 states during the past 3 years. More than 100 counties have improved their agricultural emergency response plans, and confidence has risen among participants about their ability to respond to any agricultural disaster.

# INVESTING IN Food Safety, Nutrition, and Health

FOOD SAFETY • NUTRITION  
HEALTH AND WELLNESS  
HUNGER AND FOOD SECURITY  
OBESITY AND HEALTHY WEIGHT

**P**OOOR DIETARY CHOICES, unhealthy lifestyles, foodborne illnesses, and the potential for terrorism and other attacks on the U.S. food supply are national concerns. NIFA-funded programs and our national program leadership help strengthen the nation's ability to address and reduce the negative effects of these issues as well as issues related to food security and food science and technology.

## NIFA'S FOOD SAFETY, NUTRITION, AND HEALTH PORTFOLIO INCLUDES:

**FOOD SAFETY:** Each year, millions of Americans suffer—and 5,000 die—from foodborne illness. The food safety programs that NIFA supports reduce the incidence of foodborne illness by funding research to understand disease-causing micro-organisms, toxins, and chemical contaminants in food. This broad area ranges from on-farm production to postharvest processing and distribution, to food preparation and consumption. Some of these food safety projects involve research into using thermal and high pressure (hydrostatic) processing, the irradiation of foods to reduce microbial contamination, and antibiotic resistance management.

**NUTRITION:** NIFA works with the Cooperative Extension Service to provide community-based nutrition education so people can make better food and lifestyle choices. These projects also provide policymakers with the information they need to make appropriate decisions.

**HEALTH AND WELLNESS:** NIFA-funded programs address the health issues of agriculture, community and economic vitality, and family and youth development.

**HUNGER AND FOOD SECURITY:** NIFA's programs and partnerships help ensure that people have access, at all times, to enough food for an active, healthy life. At the community level, these programs address federal food assistance, food recovery and donations, and community food production and marketing.

**OBESITY AND HEALTHY WEIGHT:** Reports show that two-thirds of Americans are overweight. Through land-grant university partnerships, NIFA-funded programs provide nutrition education; conduct behavioral research; and plan, conduct, and evaluate dietary interventions.



## SECURING OUR FUTURE IN FOOD SAFETY, NUTRITION, AND HEALTH

### EXTENSION EDUCATION IMPROVES HEALTH WHILE SAVING VIRGINIA \$2.4M

In 2011, **Virginia Cooperative Extension** (VCE) agents trained over 1,000 food handlers across the state in 34 manager certification courses, 24 employee food safety certification courses, and 34 general safe food handling and preparation courses. Additionally, over 459 restaurants, schools, day care centers, churches, civic groups, public service organizations, and other groups sent individuals to VCE to complete food safety training. If one case of foodborne illness is prevented per food handler who completed food safety training through VCE, the potential annual savings for Virginia is approximately \$2.4 million.

### ILLINOIS RESEARCH INCREASES VEGETABLE SAFETY

**University of Illinois** scientists combined ultrasound and chlorine washing treatments to reduce the number of *E. coli* 0157:H7 bacteria on spinach by 99.99 percent, while other technologies achieve only about a 99-percent reduction. Industry is looking for a kill step—a way to remove pathogens—while processing fresh fruits and vegetables, including salads. This approach reduces contamination and enhances safety while preserving the freshness of the produce.

Investing in research at University of Illinois has resulted in scientists discovering ways to reduce the number of *E. coli* 0157:H7 bacteria on spinach by **99.99%**!

### LANGSTON UNIVERSITY PROGRAM INCREASES URBAN FOOD SECURITY AND NUTRITION

1890 Capacity-Building Grants strengthen research, teaching, and Cooperative Extension programs at the 1890 LGUs. Since 2008, the program has awarded 298 grants (\$84,107,793) to the 18 eligible universities. At **Oklahoma's Langston University**, a grant is addressing food insecurity and poor nutrition in urban areas. Urban agriculture has become a high priority for health care organizations, nutrition planners, and policymakers as a means to prevent diet-related diseases and obesity. Langston's program established an urban teachers institute, Farm-to-School programs, 4-H nutrition summer camps, and school garden projects.

## SECURING OUR FUTURE IN FOOD SAFETY, NUTRITION, AND HEALTH



### HEALTH CARE + EDUCATION: PREVENT FOODBORNE ILLNESS IN SENIORS

A **Tennessee State University** research project has developed an innovative approach for integrating food safety education into preventive health care for adults over 60. This project works with health care providers to develop, evaluate, and deliver food safety educational materials for older adults. A website was developed for nurses and caregivers with information on food safety that can be printed off and used for short lessons or as handouts. The website received over 11,000 hits in 6 months with over 3,000 pages printed. Online material included 72 recipes with food safety hints.

### FOCUSING ON FOODBORNE THREATS BEFORE THEY BECOME U.S. PUBLIC HEALTH ISSUES

*E. coli* O104:H4 is a newly recognized strain of bacteria that was responsible for over 30 foodborne illness related deaths in Germany in 2011. While this strain has not yet caused foodborne illness in the United States, it caused 20 percent more deaths worldwide than other strains of *E. coli*. Researchers at **Michigan State University** are investigating why this strain causes such severe illness and effective strategies for preventing them. Also, researchers at the **University of Nebraska** and **Kansas State University** are evaluating the ability of the German strain to infect the gastrointestinal tract of cattle. This NIFA-funded research is critical to understanding the threat of this new strain to public health and the U.S. food supply.

### ENCOURAGING HEALTHY HABITS IN RURAL NEW YORK THROUGH SOCIAL MEDIA

Residents in New York's rural areas have greater access to health promotion information, thanks to the Adopting Healthy Habits project. The **Cornell University Cooperative Extension** project targets healthy eating habits and increased activity to prevent childhood obesity through awareness, community support, and accessibility using various media sources. Specific outputs from the project included a media campaign of 30-second public service announcements that feature specific health messages (drinking water instead of sweetened beverages; eating more fruits and vegetables; playing actively with your family) that reached 337,960 households; a half-page ad printed in the local newspaper that reached 44,000 people; a Web-based ad that was viewed 100,000 times; and local radio spots that reached 60,000 listeners. A Facebook link shared with other Cooperative Extension sites around New York State received 1,700 visits in 1 week.

### EFNEP PROVIDES NUTRITION EDUCATION FOR AMERICA'S POOREST OF THE POOR

NIFA's Expanded Food and Nutrition Education Program (EFNEP) addresses some of our most pervasive societal challenges—hunger, malnutrition, poverty, and obesity—by providing practical, hands-on nutrition education to the poorest of the poor. Each year, EFNEP peer educators teach more than a half million low-income families and youth how to change their behavior toward food. More than 80 percent of EFNEP families report living at or below the poverty threshold, and nearly 70 percent indicate being of minority status. A 2012 national review of EFNEP data showed that 95 percent of EFNEP graduates improved the quality of their diets, 88 percent improved their nutrition practices, 86 percent stretched their food dollars farther, 66 percent handled their food more safely, and 28 percent increased their physical activity by at least 30 minutes each day.



### CHILDHOOD OBESITY PREVENTION PROGRAM EARNS PRESIDENTIAL AWARD

A researcher from **Colorado State University** won the 2011 Presidential Early Career Award for Scientists and Engineers for her research in childhood obesity prevention. The "Mighty Moves" project is an 18-week program where preschoolers engage in activities aimed at enhancing gross motor development and increasing structured physical activity opportunities in the classroom. Equally important, the program addressed the physical and nutritional education needs of parents and teachers. The program targeted these "secondary influencers" who are the most direct role models of young children.

Investing in the EFNEP program resulted in **95%** of graduates improving the quality of their diets; **88%** improving their nutrition practices; **86%** stretching their food dollars farther; **66%** handling their food more safely, and **28%** increasing their physical activity by at least 30 minutes each day!

### NANOSCALE SCIENCE AND ENGINEERING HELP DETECT FOOD SAFETY HAZARDS

The increasingly global nature of agriculture has created an urgent need for sensors that can rapidly and reliably detect and identify the source of hazardous agents at all points in the food supply chain. A research community of 30 scientists and engineers from 21 states is developing nanotechnology-enabled sensors (nanosensors) for food safety, biosecurity, and other agricultural needs. One example is an integrated biosensor system for rapid screening of avian influenza in poultry, developed by scientists at the **University of Arkansas** and an international, multidisciplinary research team. A 2001–2002 outbreak of low pathogenic avian influenza in the United States



resulted in the loss of over 4.5 million chickens and turkeys that amounted to about \$125 million. Worldwide, more than 140 million birds have died or been destroyed due to avian influenza H5N1, and losses to the poultry industry are in excess of \$10 billion worldwide. Nearly 360 people in 16 countries have been infected and died since 2003. The sensor provides an urgently needed detection capability for controlling the spread of avian influenza.

## INVESTING IN

# Renewable Energy, Natural Resources, & Environment

AIR QUALITY • SOIL QUALITY  
CLIMATE EFFECTS ON AGRICULTURE  
RENEWABLE ENERGY  
WILDLIFE AND FISH

**N**IFA'S NATIONAL PROGRAM LEADERSHIP integrates research, education, and Cooperative Extension expertise to address environmental and natural resource priorities. The agency's programs seek to develop the next generation of biofuels that will not only power machines but the American economy as a whole. Furthermore, these programs improve air, soil, and water quality; fish and wildlife management; sustainable use and management of forests, rangeland, and watersheds; and lead to a better understanding of how the changing climate effects agriculture.

### NIFA'S RENEWABLE ENERGY, NATURAL RESOURCES, AND ENVIRONMENT PORTFOLIO INCLUDES:

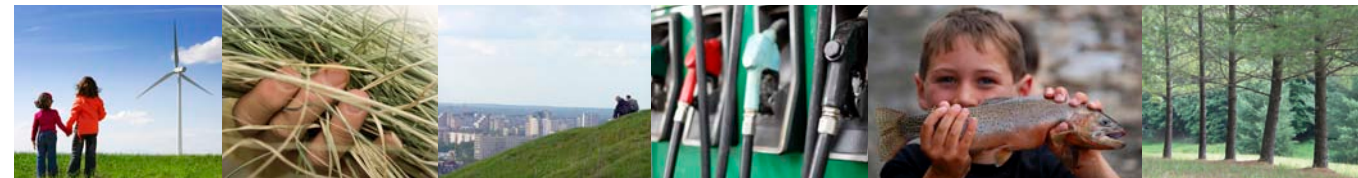
**AIR QUALITY:** The agency's research partners work to improve the measurement, control, and transport of odor, gases, and particulate matter from agricultural operations.

**SOIL QUALITY:** NIFA-funded projects study the effect of soil micro-organisms and nutrients on greenhouse gases and how judicious soil management practices can help control or reduce these gases.

**CLIMATE EFFECTS ON AGRICULTURE:** Adapting to changing climate conditions is one of the most pressing problems for agricultural producers. The climate change projects that NIFA supports focus on reducing greenhouse gas concentrations and anticipating natural and human impacts on agricultural ecosystems.

**RENEWABLE ENERGY:** The country's dependence on foreign oil needs to be reduced. NIFA-funded programs support the development of regional systems to develop, produce, and deliver sustainable biobased products. America's goal is to produce 36 billion gallons of biofuels per year by 2022.

**WILDLIFE AND FISH:** Wildlife and fish contribute to healthy ecosystems, provide income to landowners, and offer recreation opportunities to sportsmen. The projects that NIFA enables study wildlife ecology and management, provide training for future wildlife professionals, and inform landowners about invasive species and animal-to-human diseases.



### SECURING OUR FUTURE IN RENEWABLE ENERGY, NATURAL RESOURCES, AND ENVIRONMENT

#### MINNESOTA VOLUNTEER NATURALISTS WORK TO SAVE THE ENVIRONMENT

Minnesota Extension's Master Naturalist program trained over 1,000 volunteers and instructors, and 84 percent are still active. These volunteers have committed 121,144 hours of service over the past 5 years to protect the environment. Minnesota's Master Naturalists participate in lake and stream monitoring, eradication of invasive species, lake shore restoration, clearing trails, emerald ash borer monitoring, teaching nature courses, planting trees, and leading hikes. Their volunteer efforts have been valued at over \$2,480,000.

#### FLORIDA RESEARCHERS EXPAND THE USE OF SWEET SORGHUMS FOR BIOFUELS

A NIFA Biomass Research and Development Initiative (BRDI) grant is helping investigators at the University of Florida develop the next generation of sweet sorghums as a source of biomass for fuels, chemicals, and other high-value products. This BRDI project includes production of superior sorghum cultivars and novel biochemical conversion technologies. Sweet sorghum is a tall grass with stems that contain a sugar-rich juice.

#### 4-H PARTICIPANTS BECOME "STEWARDS OF THE NATURAL WORLD"

Washington State University-led 4-H programming collaborates with local and tribal governments to mentor youth in the area of environmental education. The 4-H Fish and Forest Stewards Program works with the Tulalip Tribe, Snohomish County schools, and non-profit groups in rural communities that are affected by poverty and job loss. The curriculum is focused on watersheds, water quality, native plants, salmon habitat/stewardship, forests and wildlife, climate change, and local history. The 4-H Eco-Stewardship Program is another Washington State Cooperative Extension offering to students residing in Chelan and nearby counties. Through this program, students develop a deeper understanding of the relationship between healthy forests and healthy communities. This programming earned the 2010 Connecting Youth with Nature through Environmental Conservation Award from 4-H National Headquarters, the U.S. Department of the Interior, and the U.S. Fish and Wildlife Service.

SECURING OUR FUTURE IN  
RENEWABLE ENERGY, NATURAL RESOURCES, AND ENVIRONMENT

OHIO-LED BRDI PROJECT PARTNERS  
DEVELOP NEW BIOMASS TECHNOLOGY

The **Ohio State University** (OSU) is leading a NIFA-funded BRDI project to test and expand a university-developed technology that can produce biogas from a variety of solid organic wastes and bioenergy crops. Researchers at OSU, **Mississippi State University**, the **University of Georgia**, and partners in industry will develop technology for converting biogas to liquid hydrocarbon fuels to diversify the country's suite of renewable transportation fuels. The project's main goal is to enhance the integrated anaerobic digestion system, a patent-pending technology. The system has the potential to develop new markets for agricultural producers, improve soil fertility and crop yield, and reduce energy transportation costs.

NDSU PROMOTES JOBS THROUGH  
SUGAR BEET BIOFUEL RESEARCH

A researcher at **North Dakota State University** (NDSU) initiated an energy beet development program to support the development of the biofuel industry. The program established regional energy beet yield trials, initiated a juice storage study, tested sugar beet ethanol production commercially, and conducted grower education meetings. Producers, rural communities, and industry are learning of the opportunity through workshops and on the eXtension website. Construction of a commercial plant is possible as early as 2015. A sugar beet ethanol facility would require 30,000 acres of energy beets, which would provide growers with increased income and create 25 new jobs in rural communities.

This BRDI project—together with 19 others—leveraged over **\$67M**, reached over **17K** learners through outreach programs, and generated **21** patent applications!

FRTEP ENHANCES WASTEWATER  
MANAGEMENT ON A RESERVATION

When **Leech Lake Band of Ojibwe Tribe** water resource professionals discovered that 60 percent of the **Minnesota** reservation's septic systems were sub-standard or failing, they feared for the reservation's health, indigenous rice fields, and 270 fishable lakes. Leech Lake Reservation's extensive water resources were threatened by untreated wastewater from an estimated 1,200 failing septic systems. Through the NIFA-funded Federally Recognized Tribes Extension Program (FRTEP) grant, Cooperative Extension agents conducted extensive outreach and education, going door-to-door to explain the importance of proper septic care with reservation homeowners. Agents also conducted a youth camp around water quality and answered stakeholder questions and concerns. Extension activities are responsible for increasing participation in reservation septic evaluation and upgrade efforts.

EXTENSION GROWER NETWORK SAVES  
114 BILLION GALLONS OF WATER EACH YEAR

A professor at the **University of Nebraska** developed a network of farmers over the past 7 years that has adopted new, improved technologies for irrigation/water management. As of 2012, this network of more than 1,100 farmers and over 1.5 million acres of cropland has reduced the amount of irrigation by 114 billion gallons of water annually—enough water to supply a city the size of Tucson, AZ, for a full year. This work is supported in part by NIFA Hatch and Smith-Lever funds. Next steps include improving nutrient management, soil quality, and cost/benefit analysis to protect the environment and improve agricultural profitability.

BRDI PROJECT IMPACTS LOCAL COMMUNITY

A NIFA-funded BRDI project is partnering Domtar Paper with **North Carolina State University**, the U.S. Forest Products Lab, and others, to produce power and chemical products from an existing pulp and paper mill. The project leverages assets and infrastructure and has protected at least 100 jobs in North and South Carolina.

"MERCURY-EATING" TREES CLEAN UP  
ENVIRONMENTAL SITES

Using funds provided by the McIntire-Stennis program, the **University of Georgia** has developed biologically engineered trees that can clean up the thousands of acres of land that have been contaminated with mercury. Using these trees instead of those developed by conventional methods can save millions of dollars per contaminated site and avoids the environmental disruption of the sites that conventional technologies would cause.

GEORGIA AND MARYLAND SCIENTISTS  
IMPROVE HONEY BEE HEALTH

Managed honeybees, which pollinate over 130 fruit and vegetable crops, are vital to agriculture in the United States—California almond growers, for example, rely on beekeepers to provide pollinators for over 835,000 acres of almond trees. However, in 2006, reports emerged of a widespread condition called Colony Collapse Disorder (CCD), in which all of the worker bees suddenly vanish. One result of the declining bee population is that the cost to rent hives has tripled in the past decade. In response, the **University of Georgia** and 14 collaborating institutions began a NIFA-funded "Protection of Managed Bees" project. Researchers have



identified varroa mites as a key cause of CCD. This project's tech-transfer team helped honeybee queen breeders select for hygienic behavior, a trait that helps bees defend against Varroa mites and other threats. A second bee project, the **University of Maryland**-led "Bee Informed Partnership," builds on the research findings of the first. Additional tech teams offer assistance to diagnose diseases and pests, assist with stock selection and breeding for resistance traits, and enhance genetic diversity in bee stocks.

NATURAL ADHESIVE REDUCES  
AIR POLLUTANTS

Wood adhesives are mostly made from non-renewable, petroleum-based chemicals and may contain the hazardous chemical formaldehyde. **Oregon State University** has successfully developed an environmentally friendly wood adhesive from soybean flour for use in the commercial production of indoor plywood. By replacing the hazardous chemicals with soy flour adhesive, plywood production plants have reduced the emission of hazardous air pollutants by 90 percent, and this biobased product is contributing to creation of additional jobs in rural communities.

Investing in research at Oregon State University has resulted in the creation of an environmentally friendly wood adhesive made from soybean flour. By replacing conventional adhesive, plywood production plants have reduced the emission of hazardous air pollutants by **90%**!



# INVESTING IN Agricultural Systems and Technology

**A**GRICULTURAL SYSTEMS—BOTH CROP AND ANIMAL—involve issues such as labor, marketing, finances, natural resources, genetic stock, and equipment. Projects that NIFA supports address these issues as a system, rather than individually, because a holistic approach offers greater management flexibility, safer working conditions, and a more sound economic and environment.

## NIFA'S AGRICULTURAL SYSTEMS AND TECHNOLOGY PORTFOLIO INCLUDES:

### MANURE AND NUTRIENT MANAGEMENT:

Manure is a valuable, slow-release fertilizer that allows farmers to recycle animal waste back into the environment; however, too much can cause a multitude of problems. NIFA-funded projects work to ease many of these problems, including odors, nitrogen, greenhouse gases, and the accumulation of pathogens.

**ORGANIC AGRICULTURE:** The organic industry is the fastest growing segment of U.S. agriculture. Organic agricultural systems and practices provide many environmental services and environmental stewardship is a key principle. Programs such as NIFA's Organic Research and Extension Initiative address issues critical to organic agriculture through research, education, and extension activities.

**FARM SAFETY:** Farming is one of the most dangerous occupations in the country, with hundreds of farmers killed on the job each year and thousands more injured. Many of the NIFA-enabled programs help train farm workers to do their jobs more safely. The agency also supports USDA's AgrAbility program, which trains thousands of disabled farmers and ranchers to remain active in the profession.

**TECHNOLOGY:** Rapid advances in biological, chemical, and physical sciences expand knowledge of agriculture and the environment. Technology translates scientific knowledge into action. NIFA-funded programs support technology development, academic training, and technology transfer to ensure safer, higher quality foods; more efficient agricultural practices; and to enhance job growth.

MANURE AND NUTRIENT MANAGEMENT  
ORGANIC AGRICULTURE  
FARM SAFETY  
TECHNOLOGY



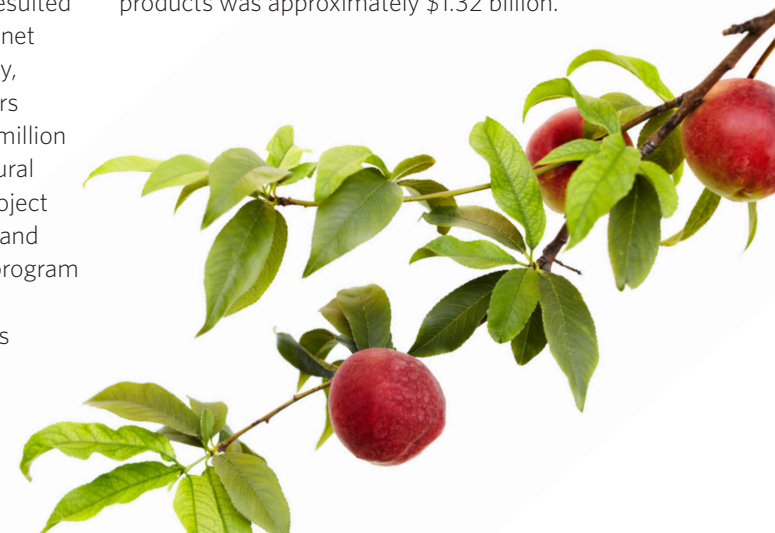
## SECURING OUR FUTURE IN AGRICULTURAL SYSTEMS AND TECHNOLOGY

### INNOVATIVE TECHNOLOGY THINS FRUIT BUT FATTENS PROFITS

Deciduous fruit trees produce more fruit than is needed to make a profitable crop, but the only reliable current strategy for removing excess fruit is hand-thinning. This practice can require as much as 100 laborer hours per acre, or 10 people who each work for 10 hours on each acre of orchard. Depending on the region, this can cost \$750 to \$1,120 per acre. An integrated team led by **Penn State University**, and including members from **Washington State University**, **University of California-Davis**, and **Clemson University**, has developed an automated system for fruit thinning that can reduce the labor requirement by 50 percent. For peach crops, these tractor-mounted or handheld thinners also resulted in better fruit quality and yield to an average net economic output of \$694 per acre. Nationally, the annual economic benefit to peach growers is \$82.5 million and a labor reduction of 5.9 million hours, which could increase the revenue of rural economies by \$181.5 million per year. The project is expanding into other crops (apple, cherry, and plum) with similar results. Adoption of this program across all potential crops could translate to a positive economic impact on rural economies of almost \$1 billion per year.

### KENTUCKY PRIVATE FORESTERS LEARN TRICKS OF THE TRADE

Extension programs in **Kentucky** trained 7,827 family forest owners on better forest management, stewardship practices, and invasive species management. Cumulatively, this resulted in over 505,880 acres protected or improved. In addition, logger and forest industry training resulted in 312 jobs being created or saved; 269 firms that were established or expanded; and \$126.6 million earned or saved. The fiscal impact from logging programs resulted in \$101 million in direct stumpage revenue to family forest owners. The total contribution of supporting industries to the economy of Kentucky through the production of finished paper and wood products was approximately \$1.32 billion.



SECURING OUR FUTURE IN  
AGRICULTURAL SYSTEMS AND TECHNOLOGY

DISASTER EDUCATION THROUGH SMARTPHONE AND YOUTUBE TECHNOLOGIES

Floods are the most common and widespread of all natural disasters—except fire—and most communities in the United States have experienced some kind of flooding. **North Dakota State University** Extension Service has developed a series of disaster-related smartphone applications and YouTube videos to address many of the challenges associated with flooding. These technologies provide guidelines related to emergency management and prevention and help users record property damage to their property using text, images, and audio through their

smartphones. Since the project’s inception, consumers have downloaded the Disaster Recovery Log more than 2,500 times and the Winter Survival Kit more than 64,000 times. The Federal Emergency Management Agency (FEMA) recognized this project with the FEMA 2012 Individual and Community Preparedness Award for Innovative Use of Technology. NIFA, FEMA, and the Consumer Financial Protection Bureau are collaborating to increase the scale of this project to a national level.



NEW MISSISSIPPI TECHNOLOGY  
DETECTS JUVENILE LUMBER

Harvesting juvenile wood from plantation pine acreage results in production of weak lumber, warp-prone lumber, weak composite products, buckling in plywood veneers, and weak paper products—a condition that results in an annual loss of \$550 million to the lumber manufacturing industry. Researchers in **Mississippi State University’s** Department of Forest Products have developed and patented a scanner that can detect juvenile wood in green lumber in the sawmill. Segregating juvenile lumber and using warp-reducing techniques to dry it has led to the recovery of a considerable portion of previously lost revenue.

PENN STATE PILOT PROGRAM BRINGS FARM  
SAFETY TRAINING TO HISPANIC YOUTH

Agriculture is one of the nation’s most hazardous industries. While agricultural safety and health training material does exist, it is primarily available only in English—which is not very useful to the Spanish-speaking workers who represent a large portion of the nation’s agricultural workforce. A **Penn State** pilot program transformed existing curricula into Spanish and included culturally appropriate examples and illustrations, an instructor manual, and 38 short Spanish-language video clips—all available on hand-held electronic devices. The materials are online and are available to instructors and Cooperative Extension agents across the country.

ALABAMA PRECISION AGRICULTURE  
LEADS TO A CLEANER ENVIRONMENT  
AND INCREASED PROFITS

Precision agriculture adoption in **Alabama** continues to increase, with producers implementing technology on nearly 70 percent of crop land. When farmers adopt these modern tools, they see an estimated 10-percent reduction in applied fertilizers and pesticides—approximately \$22 million, state-wide. Part of the state’s success in this area is attributable to **Auburn University’s** membership in the Transatlantic Precision Agriculture Consortium, which includes Auburn, the **University of Georgia**, **Mississippi State**, and three European universities. The consortium’s goal is to foster global awareness and competence of students, faculty, and staff by sharing the latest developments in precision agriculture.

WASHINGTON SMALL BUSINESS PRODUCES  
VALUE-ADDED ENVIRONMENTAL PRODUCT

Forest Concepts, located in **Auburn, WA**, has successfully commercialized a soil erosion product called “WoodStaw.” Using funds from an SBIR award, WoodStaw is made from low-grade waste wood veneer and resembles oversized pick-up sticks. WoodStaw replaces grass straw, which contains seeds and can be easily blown away by wind. Woodstaw can be easily baled and thus transported by truck to where it is needed and spread by hand, straw blower, or helicopter. In initial field trials, WoodStaw reduced erosion by more than 98 percent and has proven especially effective in reducing erosion in areas that have been impacted by forest fires. WoodStaw has improved the sustainability of independent veneer mills by providing a value-added outlet for low-grade veneer and offering a sustainable, ecologically compatible year-round erosion control product at a competitive price.

One Georgia nursery increased profitability by more than **\$46,000** per acre by precisely monitoring crop water needs with wireless sensors.

If **75%** of the nation’s **3.3 million** acres of nursery crop growers adopt wireless sensor networks, nurseries could increase profitability by **\$113.4 billion** per year!

PRECISION NURSERY IRRIGATION  
VIA WIRELESS SENSOR NETWORK

One of the most important decisions for nurseries is how to best manage dwindling water resources. A **University of Maryland**-led integrated project team is developing strategies to help growers precisely monitor crop water needs with wireless sensors. This system will allow growers to irrigate only those areas that need it and in the exact amounts they need. One **Georgia** nursery was able to increase profitability by over \$46,000 per acre by reducing water use and increasing the number of marketable plants. Water use at this nursery has been reduced by at least 50 percent. According to USDA’s National Agricultural Statistics Service, if 75 percent of the nation’s 3.3 million acres of nursery crops adopt wireless sensor networks, nurseries could increase profitability by \$113.4 billion per year. Further, this improvement in irrigation efficiency would save over 2.5 trillion gallons of water per year—enough water for approximately 78.9 million people.

# INVESTING IN Agricultural Economics and Rural Communities

**PROSPERITY AND ECONOMIC SECURITY** for individuals and families, farmers and ranchers, entrepreneurs, and consumers across the country is key to a strong economy. NIFA funding and program leadership provide for research, education, and extension activities that help people make sound financial management decisions, discover new economic opportunities, develop successful agricultural and nonagricultural enterprises, take advantage of new and consumer-driven markets, and understand the implications of public policy on these and other activities.

## NIFA'S AGRICULTURAL AND RURAL COMMUNITIES PORTFOLIO INCLUDES:

**FARM FINANCIAL MANAGEMENT:** Successful farm management involves integrating production land, labor, financial resources, and understanding of the many elements of agriculture risk management. NIFA-funded programs provide staff expertise to help farm operators achieve economically viable, ecologically sound, and socially responsible farm businesses.

**FINANCIAL SECURITY:** NIFA-funded programs help people acquire the skills, knowledge, and motivation to build financial security. Face-to-face and Web-based extension program participants learn to achieve financial self-sufficiency and stability, which is the cornerstone of prosperous communities.

**MARKETS, TRADE, AND POLICY:** Moving products from producers to consumers is vital to a successful agricultural enterprise. NIFA supports agricultural marketing with programs that provide information to expand markets and reduce trade barriers, support international economic development, and generate new or improved products and processes to expand markets.

**RURAL AND COMMUNITY DEVELOPMENT:** Prosperous and sustainable communities ensure that rural America continues to serve as an economic engine and a great place to raise a family. The agency's regional partnerships help enable rural citizens to guide the development of their rural communities; provide information and resources to local decisionmakers; and help families, farms and ranches, communities, and businesses achieve prosperity and security.

FARM FINANCIAL MANAGEMENT  
FINANCIAL SECURITY  
MARKETS, TRADE, AND POLICY  
RURAL AND COMMUNITY DEVELOPMENT



## SECURING OUR FUTURE IN AGRICULTURAL ECONOMICS & RURAL COMMUNITIES

### CANOLA JOINS OKLAHOMA'S PORTFOLIO OF WINTER CROPS

Oklahoma farmers have a new alternative crop. Mild winters allow year-round agriculture in Oklahoma, including winter wheat—but when wheat is grown year after year on the same fields, yields and quality begin to decline. Now, **Oklahoma State University** researchers and extension experts, with NIFA funding and national program leadership, have introduced winter canola. The crop fits grower needs and offers several advantages, including its ability to break up the weeds, pests, and pathogens that plague repeated wheat plantings; drought tolerance; local growing, which reduces the amount of canola imports; and job growth.

### MICROENTERPRISE SECTOR SPURS DEVELOPMENT FOR UNDERREPRESENTED GROUPS

A project in Alabama promoted conditions necessary for the development of the microenterprise sector among small and socially disadvantaged communities. An **Alabama A&M** project focused on this audience, teaching entrepreneurship as a tool to increase their ability to take control of their lives in the face of limited job opportunities. The project is also providing encouragement for existing entrepreneurs and for labor force development, including measures to counterbalance the migration of labor to urban centers.

### MINNESOTA ESTATE-PLANNING WORKSHOPS SAVE FARMLAND

Extension professionals delivered workshops to farmers in **Minnesota** to illustrate the importance of estate planning and provided concrete strategies for creating a transfer plan. The value of assets protected after receiving education from extension was \$1,689,609, including owned land, livestock, equipment, and machinery. After calculating non-farm/ranch assets for participant families, the total financial impact of protected rural property can be assessed at \$384,300,000.

### FRTEP BUILDING AGRICULTURE ECONOMIES ON AMERICAN INDIAN RESERVATIONS

The Federally Recognized Tribes Extension Program expands Cooperative Extension to American Indian reservations through targeted programs in production agriculture, youth development, natural resource conservation, and human nutrition. For example, the **University of Idaho's** Fort Hall FRTEP agent identified a limitation of ranch profitability on the reservation due to cattle death from improper vaccine management. As a result of extension education programs, ranchers and retailers have changed their vaccine storage and handling practices and saved entire herds that are valued at \$1,400 per head.

SECURING OUR FUTURE IN  
AGRICULTURAL ECONOMICS AND RURAL COMMUNITIES



WISCONSIN APPRENTICESHIP PROGRAM  
“GROWS” FUTURE DAIRY FARMERS

Wisconsin is losing many of its small and mid-sized dairy farms because few young and beginning dairy farmers are prepared to manage operations as aging dairy farmers retire. The GrassWorks Dairy Grazing Apprenticeship (DGA) program, with funding from NIFA’s Beginning Farmer and Rancher Development Program, is working to resolve this issue by educating a new generation of dairy farmers while providing a mechanism for investment, growth, and transition for current and soon-to-retire farmers. DGA solicits practicing dairy farmers to serve as Master Graziers to the apprentices, who receive both 2 years of mentored on-farm employment and 288 hours of related classroom instruction.

CORNELL-LED TEAM ESTABLISHES  
BROCCOLI INDUSTRY IN THE EASTERN  
UNITED STATES

Broccoli is typically grown along California’s coast and foggy valleys where average temperatures are between 55° and 65° Fahrenheit. Broccoli must be refrigerated after harvest for maximum nutrient quality. However, an increase in the cost of cooling and shipping broccoli long distances has led to broccoli production east of the Mississippi River. A team of researchers and extension specialists led by Cornell University is working to develop and test broccoli cultivars that are suited to the climate and soils from Maine to Florida and westward into Ohio and Tennessee. Conservative estimates indicate

that Eastern broccoli production will result in a 66-percent reduction in fuel used to transport the crop to market. This will save close to 2.3 million gallons of fuel per year and reduce carbon dioxide emissions by over 51 million pounds per year. The team expects that growers in the region will see increased profits of \$3,000 per acre per year, which translates to increased profits of \$40 million. The total annual economic impact on rural economies will be almost \$90 million.

JOB GROWTH THROUGH NCRCRD

The Michigan State University-led North Central Regional Center for Rural Development (NCRCRD), in its 12-state coordinating role, developed a set of common benchmarks for programming to enhance job retention and growth in the region. NCRCRD’s highly acclaimed webinar series helped stakeholders identify best practices in rural economic and community development. The North Central region has documented over 32,000 jobs created or saved as a result of NCRCRD programs. As an example, University of Wisconsin Extension helped 3 counties merge their economic development efforts, which resulted in \$2 million in business assistance grants, \$15 million in private investment in local businesses, and 450 new jobs.

E-BEAT GETS MISSISSIPPI CONNECTED

Mississippians rank digital literacy as one of their greatest needs. Mississippi State University Cooperative Extension and the Southern Region Rural Development Center’s e-BEAT deliver a variety of programs that introduce Internet applications to multiple audiences, including local government, community organizations, small businesses, and the public. Face-to-face and online programs teach people why broadband Internet is important and how they can implement technology to better their lives. Cooperative Extension team members have worked with state agency partners to carry out technical assistance activities, including wireless provider/carrier interactions, small city/town Wi-Fi projects, individual/small business access assistance, and business development.



CYFAR PROGRAMS SUPPORT  
AT-RISK YOUTH

Children, Youth, and Families at Risk (CYFAR) projects serve 26,600 youth ages pre-K to 19 and their parents through the Cooperative Extension programs of 42 LGUs. CYFAR receives its quality research information and program materials from CYFERnet, the Children, Youth, and Family Educational Resource Network. CYFAR projects cross disciplines, program areas, and geographic lines to empower family members of all ages through comprehensive, intensive, community-based programs. Examples include: The Community Gardens in North Carolina project addressed hunger, poor diet, and at-risk youth by providing under-served, low-income people with the resources necessary to grow their own fresh fruits and vegetables. Families who participated in the hands-on nutrition and community garden curriculum grew their own fruits and vegetables, saved money, and enhanced the nutritional quality of their meals. Two rural Nebraska counties developed community coalitions to increase family self-sufficiency, strengthen positive parenting skills, support young peoples’ pursuit of higher education, and increase positive youth behaviors. Their program is available in both English and Spanish.

OREGON-LED COOPERATIVE IMPROVES  
REVENUES FOR SMALL AND MID-SIZED  
ORGANIC FARMS

Oregon State University is leading a group of researchers and educators to form the Northern Organic Vegetable Improvement Collaborative (NOVIC) to address the seed and plant breeding needs of organic farmers in the Northern United States. Success in organic agriculture requires plants that thrive under organic production challenges such as weed competition, low-input fertility, and pest and disease pressure. Success in organic markets also demands superior flavor, nutrition, and local availability. NOVIC partners with small and mid-sized organic farmers to breed new varieties of broccoli, carrot, snap pea, sweet corn, and winter squash; identify existing varieties that perform best for organic agriculture; and educate farmers on organic seed production and plant variety improvement.



ENHANCING ORGANIC APPLE  
PRODUCTION THROUGH RESEARCH,  
EDUCATION, AND EXTENSION

Apples are an important component of New England’s diversified agriculture, but challenges associated with growing the traditional apple (McIntosh) has limited the number of organic apple orchards in the region. This University of Vermont project used NIFA OREI funding to educate organic growers on how to transition to Honeycrisp, Ginger Gold, Macoun, Liberty, and Zestar! apples. “OrganicA” Project outputs include an organic apple production website, an undergraduate course on organic fruit production, workshops and orchard tours, and presentations at meetings from local to international levels. The project is creating a change in action among program participants.

FREQUENTLY ASKED QUESTIONS ABOUT NIFA

WHEN WAS NIFA ESTABLISHED?

NIFA was established on October 8, 2009, and traces its legacy back through USDA's Cooperative State, Research, Education, and Extension Service, which itself was created in 1994 from the merger of the Cooperative State Research Service and the Extension Service. The 2008 Farm Bill authorized the establishment of NIFA as an independent, science, and policy-setting agency for the food and agricultural sciences with a charge of facilitating our nation's investments in agricultural research, education, and extension. NIFA's mission is

to lead food and agricultural sciences to create a better future for the nation and the world. NIFA seeks to effectively serve our stakeholders and to enhance the quality, relevance, and performance of programs. As an agency, NIFA comprises four science-based institutes that focus on national science and education priorities and outcomes: Institute of Bioenergy, Climate, and Environment; Institute of Food Production and Sustainability; Institute of Food Safety and Nutrition; and Institute of Youth, Family, and Community.

WHAT IS YOUR LARGEST COMPETITIVE GRANTS PROGRAM?

AFRI is NIFA's largest competitive grants program, and funds research, education, and extension activities that provide science-based solutions to address major agricultural challenges of national, regional, and multi-state importance. AFRI projects are aligned with the 2008 Farm Bill priorities and address:

- 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.

Of the more than \$900 million worth of AFRI awards made since the enactment of the 2008 Farm Bill, 45 percent have supported Coordinated Agricultural Projects. These are larger and longer-term investments that operate on a greater scale than the grants NIFA has historically offered. AFRI CAPs include:

**BIOENERGY**

- System for Advanced Biofuels Production from Woody Biomass In the Pacific Northwest (Advanced Hardwood Biofuels-Northwest)
- Northwest Advanced Renewables Alliance: A New Vista for Green Fuels, Chemicals, and Environmentally Preferred Products
- Agro-ecosystem Approach to Sustainable Biofuels Production Via the Pyrolysis-Biochar Platform
- A Regional Program for Production of Multiple Agricultural Feedstocks and Processing to Biofuels and Biobased Chemicals (Sustainable Bioproducts Initiative)
- Southeast Partnership for Integrated Biomass Supply Systems
- NEWBio: Northeast Woody/Warm-season Biomass Consortium
- Pine Genome Reference Sequencing CAP

**CHILDHOOD OBESITY PREVENTION**

- Children's Healthy Living Program for Remote Underserved Minority Populations in the Pacific Region

**CLIMATE CHANGE**

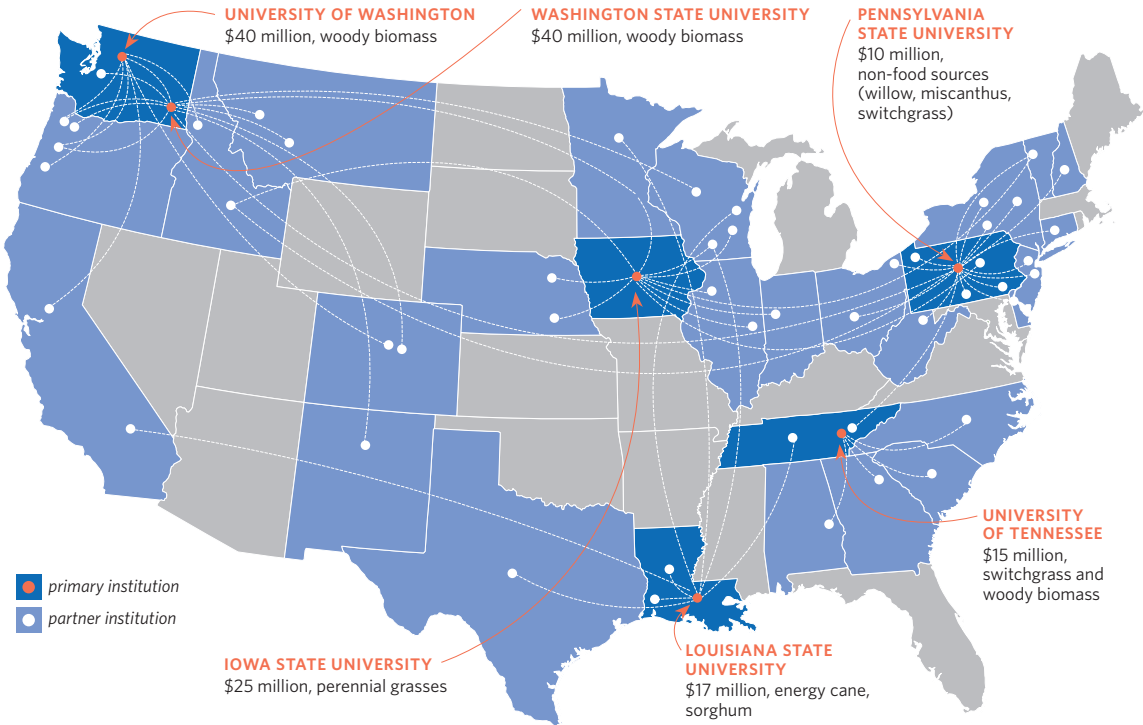
- Climate Change, Mitigation, and Adaptation in Corn-Based Cropping Systems CAP
- Regional Approaches to Climate Change for Pacific Northwest Agriculture CAP
- PINEMAP: Mapping the Future of Southern Pine Management in a Changing World System CAP
- Improving Barley & Wheat Germplasm for Changing Environments CAP
- Climate Change Mitigation and Adaptation in Dairy Production Systems of the Great Lakes Region CAP
- Resilience and Vulnerability of Beef Cattle Production in the Southern Great Plains under Changing Climate, Land Use and Markets CAP

**FOOD SAFETY**

- Shiga-toxigenic *Escherichia coli* in the Beef Chain: Assessing and Mitigating the Risk by Translational Science, Education, and Outreach
- Building Capacity to Control Viral Food-borne Disease: A Translational, Multi-Disciplinary Approach

**FOOD SECURITY**

- Common Bean CAP
- Translating Solanaceae Diversity and Trait Variation into Applied Outcomes Through Integrative Research, Education, and Extension
- Sustainable Solutions to Problems Affecting Health of Managed Bees
- The Bee Informed Platform: A Nationwide Network for Monitoring and Maintaining Honey Bee Health and Pollination Services
- Advancing Innovative Technologies and Integrated Strategies for Sustainable Management of Thrips-Transmitted Tospoviruses
- A Predictive Model to Increase Adoption of IPM of A Mite-Virus Disease Complex in Wheat
- Reducing Losses to Potato and Tomato Late Blight by Monitoring Pathogen Populations, Improved Resistant Plants, Education, and Extension
- Integrated Management of Oomycete Diseases of Soybean and Other Crop Plants
- Integrated Program for Reducing Bovine Respiratory Disease in Beef and Dairy Cattle
- Integrated Strategies to Control and Reduce the Impact of Porcine Reproductive Respiratory Syndrome Virus



DO AFRI CAPS USUALLY SUPPORT MORE THAN ONE INSTITUTION?

Yes. CAP awards support large-scale multi-million dollar projects to promote collaboration, open communication, and the exchange of information; reduce duplication of effort; and coordinate activities among individuals,

institutions, states, and regions. As an example, the map above shows the national public/private partnerships resulting from several bioenergy CAP awards that NIFA made since the enactment of the 2008 Farm Bill.

DOES NIFA FUND SMALL BUSINESS RESEARCH AND DEVELOPMENT?

Yes. USDA's Small Business Innovation Research program is housed within NIFA's Institute of Bioenergy, Climate Change, and Environment. The program awards grants to conduct high-quality, advanced concepts research related to key scientific problems and economic opportunities. From 2008 to 2012, 531 SBIR grants were awarded, totaling \$96,477,516. The program created

economic opportunities and jobs through research and development in: Forest and Related Resources, Small and Mid-Size Farms, Plant Production and Protection-Engineering, Plant Production and Protection-Biology, Animal Production and Protection, Soil and Water Resources, Food Science and Nutrition, Rural and Community Development, Aquaculture, and Industrial Applications.

DOES NIFA SUPPORT GRADUATE STUDENTS OR POST-DOCTORAL TRAINING?

Yes. These individuals are an important part of the research, education, and extension enterprise. This training prepares the future workforce to meet the agricultural industry's increasingly complex and technologically focused demands. NIFA estimates that its programs employ 4,441 undergraduate students, graduate students, and post-doctoral workers as researchers. AFRI alone supported the following:

| AFRI RESEARCHER TYPE     | 2009  | 2010  | 2011  |
|--------------------------|-------|-------|-------|
| Undergraduate Students   | 342   | 596   | 597   |
| Graduate Students        | 526   | 811   | 753   |
| Postdoctoral Researchers | 191   | 351   | 274   |
| TOTAL                    | 1,059 | 1,758 | 1,624 |

HOW DOES NIFA GET STAKEHOLDER INPUT AND WHAT DOES IT DO WITH IT?

NIFA gathers stakeholder input to identify priority areas for new grant programs and/or to modify existing grant programs so it may respond to emerging issues related to food and agricultural science. NIFA collects input from individuals, commodity groups, industry, inter-agency federal work groups, the National Academy of Sciences,

non-governmental organizations, scientific societies, and university partners. Stakeholder input is obtained through solicitation in all of NIFA's Requests for Applications, at listening sessions or workshops, from other government and private-sector events and publications, and through interaction with stakeholders.

FREQUENTLY ASKED QUESTIONS ABOUT NIFA (CONTINUED)

WHAT TYPE OF REVIEW DOES NIFA PROGRAMMING UNDERGO?

NIFA programming is organized into subject matter areas and evaluated as “portfolios,” such as Agricultural Systems, Plant Systems, Nutrition and Healthier Food Choices, and Food Safety. Teams of reviewers rate our work based on its relevance, quality, and performance. The agency conducts internal reviews annually and external reviews on a 5-year cycle. The National Research Council is currently conducting a complete review of AFRI. NIFA’s capacity-building grants are reviewed annually through a 5-year plan of work and annual reporting process.

IS THERE ANY FOCUS TO THE SCIENCE YOU PURSUE AS YOU ADDRESS GENERAL TOPICS IN THE FARM BILL PRIORITY AREAS?

Definitely. Following NIFA’s reorganization in 2009, the agency refined its focus to work within the Farm Bill priorities to address five primary challenge areas. These challenges are included in the 2010 Research, Education, and Economics Roadmap. The Roadmap states that USDA science supports the following challenges:

- 1

Keep American agriculture competitive, secure, and sustainable
- 2

Improve nutrition and end childhood obesity
- 3

Improve food safety for all Americans
- 4

Secure America’s energy future
- 5

Mitigate and adapt to climate change

The table below outlines the complete “crosswalk” between the legislatively defined Farm Bill AFRI priority areas and the five main NIFA challenge areas, as pursued by AFRI.

| 2008 FARM BILL AFRI PRIORITY AREA ▼                  | CHILDHOOD OBESITY PREVENTION CHALLENGE AREA | CLIMATE VARIABILITY AND CHANGE CHALLENGE AREA | FOOD SECURITY CHALLENGE AREA | FOOD SAFETY CHALLENGE AREA | FOUNDATIONAL PROGRAM | NIFA FELLOWSHIPS GRANT PROGRAM | SUSTAINABLE BIOENERGY CHALLENGE AREA |
|--|---|---|------------------------------|----------------------------|----------------------|--------------------------------|--------------------------------------|
| Plant Health and Production and Products             | -   | ●   | ●                            | ●                          | ●                    | ●                              | ●                                    |
| Animal Health and Production and Products            | -   | ●   | ●                            | ●                          | ●                    | ●                              | -                                    |
| Food Safety, Nutrition, and Health                   | ●   | -   | -                            | ●                          | ●                    | ●                              | -                                    |
| Renewable Energy, Natural Resources, and Environment | -   | ●   | -                            | -                          | ●                    | ●                              | ●                                    |
| Agricultural Systems and Technology                  | -   | ●   | -                            | ●                          | ●                    | ●                              | ●                                    |
| Agricultural Economics and Rural Communities         | ●   | ●   | ●                            | ●                          | ●                    | ●                              | ●                                    |

▲ AFRI REQUEST FOR APPLICATIONS

INVESTING IN:  
AMERICA’S YOUTH



SECURING:  
FUTURE SCIENTISTS



## NIFA | INVESTING IN SCIENCE | SECURING OUR FUTURE | [WWW.NIFA.USDA.GOV](http://WWW.NIFA.USDA.GOV)

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