



Agriculture and Food Research Initiative (AFRI) FY 2014 Synopsis

ESTABLISHED BY THE 2008 FARM BILL and re-authorized in the 2014 Farm Bill, the Agriculture and Food Research Initiative (AFRI) is the nation's leading competitive grants program for agriculture. It is the flagship funding program the National Institute of Food and Agriculture (NIFA) uses to combat major agriculture-related societal challenges through research, education, and extension. AFRI is one of NIFA's major programs through which to address the six priority areas.

USDA-NIFA APPROACH

AFRI, with its broad funding portfolio, addresses every facet of agriculture, including food production, farming and ranching, renewable energy, aquaculture, nutrition, forestry, food safety, rural communities, farm efficiency and profitability, and traditional and innovative breeding techniques. AFRI advances fundamental sciences as well as translational research and development in support of agriculture and coordinates research opportunities to build on these new discoveries. Other AFRI-awarded programs deliver this science to communities through extension programs, which allows the public to make informed decisions that impact their daily lives.

With the world's population expected to exceed nine billion by 2050, NIFA works to solve the challenges of meeting the food, clothing, fuel, and shelter needs of all people.

In order for NIFA to address these critical issues, we partnered with food and agricultural scientists and educators with expertise in: 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; agricultural systems and technology; and agricultural economics and rural communities. NIFA partners with the scientific community to provide federal financial assistance grants to address critical issues in United States agriculture in the areas of global food security, water for agriculture, childhood obesity prevention, food safety, sustainable bioenergy, and climate change.

FUNDING PORTFOLIO

The **Agriculture and Food Research Initiative (AFRI)** is NIFA's flagship competitive grants program. The purpose of AFRI is to support research, education, and extension work that address key problems of national and regional importance in sustaining all components of food and agriculture. AFRI is authorized under the 2014 Farm Bill and supports work in six priority areas: 1) plant health and production and plant products; 2) animal health and production and animal products; 3) food safety, nutrition and health; 4) bioenergy, natural resources and environment; 5) agriculture systems and technology; and 6) agriculture economics and rural communities.

In FY 2014, AFRI received \$316,409,000 to administer and support basic and applied research, education, and extension programs. These programs expanded our existing investments and created new opportunities to address the food and agricultural sciences. Due to the type of funds AFRI receives, the program can continue to expend funds until they are all applied to scientific projects; therefore, all funds may not be obligated in one year. However, AFRI has a scientifically-based annual approach to the expenditures of all funds to support the challenges of food and agriculture.

Over the past five years, AFRI has received \$1,383,399,906 to advance research, education, and extension activities. This level of investment shows a gradual upward trend in funding, representing a 21 percent increase in funding from \$262,482,000 in 2010 to \$316,409,000 in 2014.

NIFA works continuously to ensure the public understands the relationship between the AFRI portfolio and the six Farm Bill priorities. While it is easy to see the relationship within the Foundational programs, the Challenge Areas and Fellowships programs aren't as obvious. Therefore, a breakout of the expended funds to date is shows the multiple disciplinary work of the entire AFRI program.

AFRI offers Food and Agricultural Science Enhancement (FASE) grants to enhance institutional capacity and attract new scientists into careers of high-priority areas of national need in agriculture, food, and environmental sciences. FASE grants provide support for postdoctoral fellowships; new investigators; and project directors at small, mid-sized, or minority-serving institutions with limited institutional success or at degree-granting institutions and state agricultural experiment stations in states where institutions have been less successful in receiving AFRI funding (NIFA identifies these states as Experimental Program to Stimulate Competitive Research states). In FY 2014, approximately nine percent of AFRI funds supported FASE grants.

AWARDS OVERVIEW

OVERVIEW OF THE APPLICATION PROCESS

While not all AFRI program areas request letters of intent (LOIs), 3,775 were submitted for consideration. Scientific program staff review LOIs in order to plan for the appropriate expertise on peer review panels. In addition, assessing LOIs ensures that proposed projects fit appropriately within AFRI program area priorities. FY 2014 was the sixth year that AFRI solicited competitive grant applications; 38 programs solicited applications that year addressing the six AFRI priority areas and four challenge areas. A total of 3,151 competitive grant applications, requesting \$2,169,374,352, were received and reviewed through a competitive peer review process (Table 2, Page 5). An additional 1,590 proposals were recommended—rated as Outstanding, High Priority, and/or Medium Priority—for funding by review panels and could have been supported, provided an additional \$1,120,819,750 was available to the program.

More than 500 experts from across the country participated in peer review panel evaluations to help select the most meritorious projects for funding (Table 3, Page 5). AFRI ensures the widest participation of qualified individuals in peer review by balancing the membership of panels carefully to reflect diversity in geographical region, type of institution, type of position, gender, and minority status. Additional expertise was brought to proposal evaluation by a number of scientists and other specialists through ad hoc reviews.

Awards totaling \$269,975,863 were made to the 467 highest-ranked applications distributed across the program (Table 4, Pages 6-7).

The success rate for AFRI applications in FY 2014, calculated in terms of number of proposals funded (excluding conferences, supplements, continuing increments of the same grant, and NIFA Fellowships) divided by the number of proposals submitted for review, was 11 percent.

AWARD TYPES

AFRI awards are made in the form of single-function research; single-function education; single-function extension; and integrated research, education, and/or extension grants (Table 5, Page 8). The mean award size for research projects was \$547,983 for up to five years, excluding FASE grants and Conference grants. These excluded grant types are often shorter in duration and have lower budget limitations than do standard research awards. The average award for integrated projects was \$1,094,323 for up to five years, excluding FASE grants and Conference grants. AFRI provided funds totaling \$680,618 in support of 22 Conference grants. These conferences brought scientists together to identify research, education, and extension priorities; provide an update on research information; and/or advance an area of science important to U.S. agriculture, food, forestry, the environment, and rural communities. Forty-nine percent of AFRI awards support fundamental research to deliver basic knowledge to advance applied research and conceptual breakthroughs in fields relevant to agriculture. Mission-linked awards accounted for the remaining 51 percent to fund applied work to address specific problems, needs, or opportunities. Multidisciplinary awards encourage

collaborations between institutions, agencies, and fields of study to solve complex problems and seek to initiate research in new areas of science and engineering that are relevant to agriculture, food, forestry, the environment, and rural communities. Multi-disciplinary teams conducted 74 percent of the AFRI awards made in 2014.

INSTITUTION TYPE DEMOGRAPHICS

AFRI engages a broad range of entities including land-grant universities (1862, 1890, and 1994), public non-land grant universities, private colleges and universities, private research foundations, federal institutions, individuals, and industry. A breakdown of submitted applications, funded applications, and FY 2014 dollars awarded is available by institution type (Table 8, Page 9).

STUDENT SUPPORT BY PROGRAM AREA

Competitive grants administered by AFRI provide jobs to train the next generation of agricultural professionals. In 2014, AFRI provided funding for more than 1,900 students and post-doctorates for more than 1,850 years, cumulatively (Table 9, Page 9).

CROSSCUTTING SCIENTIFIC AREA

AFRI makes awards that span several topics of major importance to USDA. Table 7 (Page 8) includes the crosscutting areas, number of awards, and total amount of funding for each area.

FUNDING BY SCIENTIFIC DISCIPLINE

One of the ways NIFA can assess its AFRI portfolio is by reviewing the overall projects dedicated to various commodities. Crop, Food Sciences and Human Nutrition, and Animals were the three most supported areas during this funding cycle. Table 10 (Page 10) contains a complete list, including the funding amounts.

AFRI 2014 SYNOPSIS DATA

Established by the 2008 Farm Bill and re-authorized in the 2014 Farm Bill, AFRI is the nation’s leading competitive grants program for agriculture. It is the flagship funding program NIFA uses to combat major societal challenges through research, education, and extension. AFRI is one of NIFA’s major programs through which to address six priority areas.

FIGURE 1: AFRI HISTORICAL FUNDING

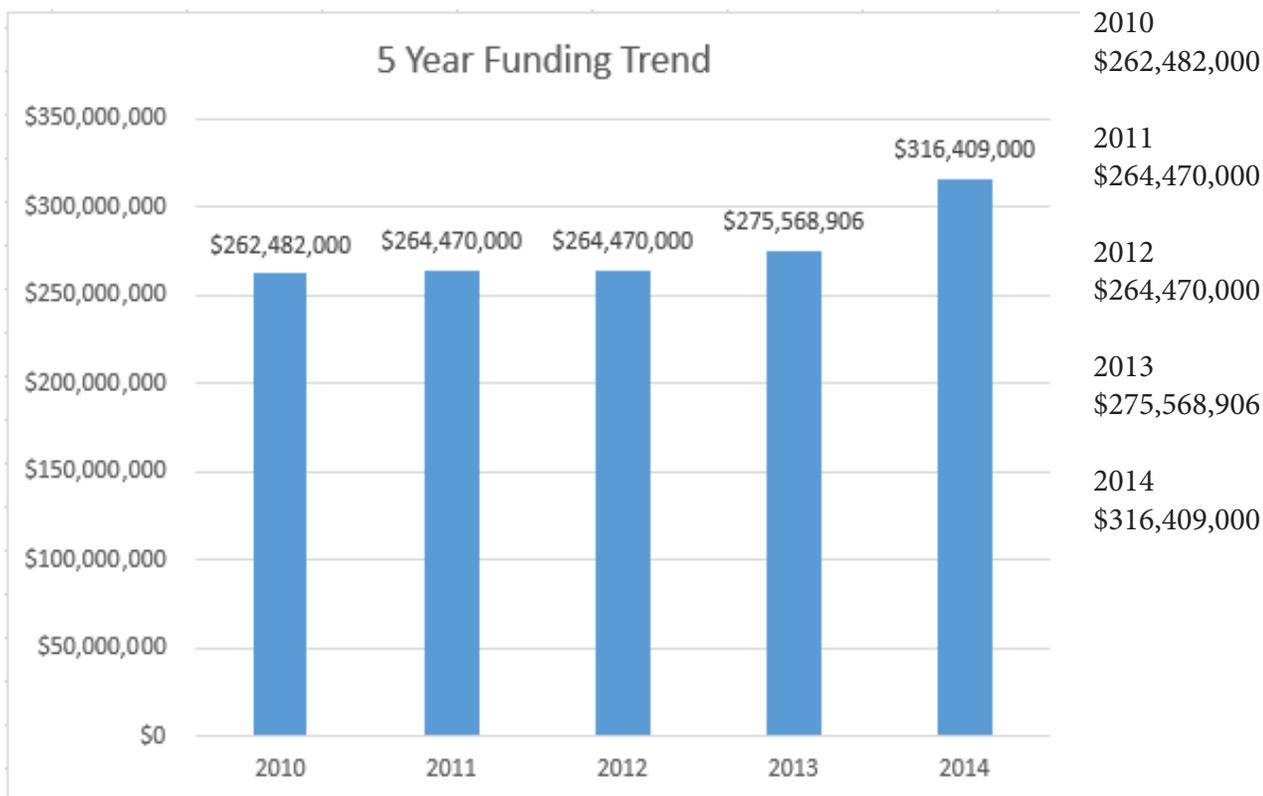


FIGURE 2: AFRI FUNDING BY FARM BILL PRIORITY

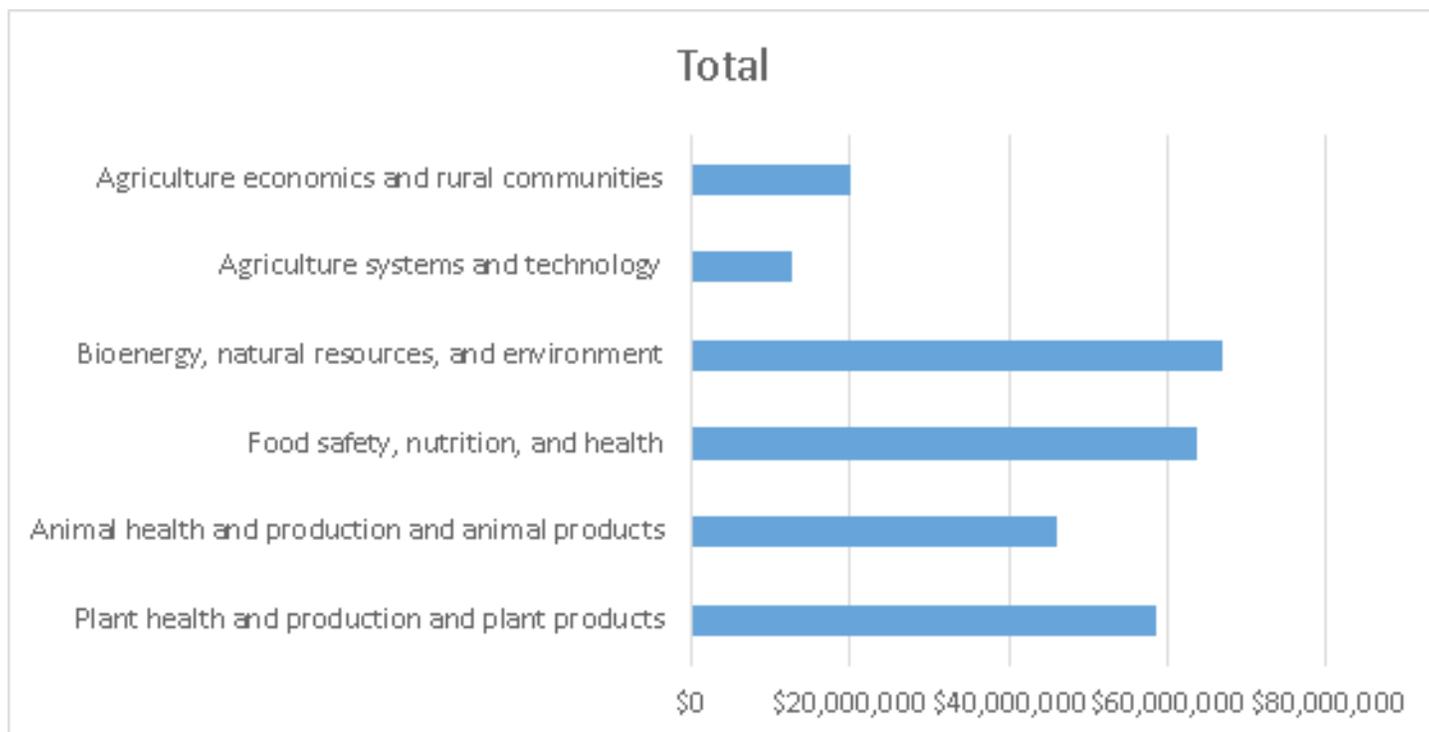


TABLE 1: SUMMARY OF THE RELATIONSHIP BETWEEN THE LEGISLATIVELY DEFINED AFRI PRIORITY AREAS AND THE CHALLENGE AREAS

AFRI provided funding for both the legislatively defined areas individually and in combination to address challenge areas.

AFRI Priority Areas	NIFA Goal 1.1	NIFA Goal 1.2	NIFA Goal 1.3	NIFA Goal 1.4	NIFA Goal 1.5	NIFA Goal 1.6	NIFA Goal 1.7	Foundational Program (All NIFA Goals)
Plant Health and Production and Plant Products	Yes	Yes	No	Yes	No	No	Yes	Yes
Animal Health and Production and Animal Products	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Food Safety, Nutrition, and Health	Yes	No	No	No	Yes	Yes	Yes	Yes
Bioenergy, Natural Resources, and Environment	No	Yes	Yes	Yes	No	No	Yes	Yes
Agriculture Systems and Technology	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Agricultural Economics and Rural Communities	No	Yes	No	Yes	Yes	Yes	Yes	Yes

NIFA Goal 1.1: Food Security

NIFA Goal 1.2: Climate Variability and Change

NIFA Goal 1.3: Water for Agriculture

NIFA Goal 1.4: Sustainable Bioenergy

NIFA Goal 1.5: Childhood Obesity Prevention

NIFA Goal 1.6: Food Safety

NIFA Goal 1.7: Education and Literacy Initiative

All Goals: Foundational Program

TABLE 1.1: AFRI PROGRAM FUNDS

AFRI funding allocations by Program Area

AFRI Programs	Rounded to the nearest Million
Food Security	\$ 34
Water for Agriculture	6
Childhood Obesity Prevention	25
Food Safety	21
Bioenergy	37
Climate Change	31
Foundational Programs	102
Pre- and Post-Doctoral Fellows	7
Inter-Agency Agreements	28
Program Administration	25
TOTAL	\$316

TABLE 2: NUMBER OF AFRI APPLICATIONS AND TOTAL DOLLARS REQUESTED, RECOMMENDED FOR FUNDING, AND AWARDED FOR FY 2014 FUNDS

Applications	Number	Funding
Requested	3,151	\$2,169,374,352
Recommended for Funding	1,590	1,120,819,750
Awarded	467	269,975,863

TABLE 3: PEER REVIEW PANEL CHARACTERISTICS

Characteristic	Number	Percent
Geographic Region		
Northeast	94	18.5
North Central	134	26.4
Southern	178	35.0
Western	102	20.1
Type of Institution*		
Land-Grant University		
1862 Land-Grant University	314	61.8
1890 Land-Grant University	42	8.3
1994 Land-Grant University	1	0.2
Hispanic-Serving	26	5.1
Public Non-Land-Grant	45	8.9
Private College/University	11	2.2
Private Research	7	1.4
Federal	34	6.7
Industry/Other	24	4.8
Type of Position		
Professor	170	33.5
Associate Professor	130	25.6
Assistant Professor	123	24.2
Federal	35	6.9
Industry	16	3.1
Other (Senior Lecturer)	34	6.7
Expertise Representation		
Researcher	325	66.1
Educator	89	18.1
Extension Educator	43	8.7
Other	35	7.1
Gender/Minority Representation		
Non-Minority Male	191	37.6
Non-Minority Female	124	24.4
Minority Male	121	23.8
Minority Female	72	14.2

TOTAL PANELISTS: *99 panelists represented the USDA Experimental Program to Stimulate Competitive Research (EPSCoR) states and 56 panelists represented small and mid-sized institutions.

TABLE 4: FUNDING BY PROGRAM

Foundational Programs	Number of Applications	Number of Awards	Fiscal Year 2014 Funding
Plant Health and Production and Plant Products			
Biology of Agricultural Plants	198	17	\$7,183,142
Insects and Nematodes	169	15	4,759,080
Understanding Plant-Associated Microorganisms	158	10	4,827,242
Controlling Weedy and Invasive Plants	59	9	3,930,000
Plant Breeding for Agricultural Production	94	9	3,560,000
Plant Photosynthetic Efficiency and Nutrient Utilization	59	8	2,802,025
Animal Health and Production and Animal Products			
Animal Breeding, Genetics, and Genomics	51	9	2,476,842
Animal Reproduction	90	12	3,344,887
Animal Health and Disease	222	28	9,377,869
Animal Well-Being	31	2	847,921
Dual Use of Animals for Dual Benefit	2	2	3,200,000
Ecology and Evolution of Infectious Diseases	2	2	1,478,712
Improved Nutritional Performance, Growth, and Lactation of Animals	131	16	5,716,006
Tools and Resources-Veterinary Immune Reagents	5	1	500,000
US-UK Collaborative Projects: Animal Health and Disease and Veterinary Immune Reagents	40	5	2,302,893
Food Safety, Nutrition, and Health			
Improving Food Safety	110	13	4,380,496
Function and Efficacy of Nutrients	101	13	4,378,696
Improving Food Quality	109	12	4,376,898
Bioenergy, Natural Resources, and Environment			
Microbial Communities in Soil	90	5	1,380,791
Agro-Ecosystem Management	88	14	6,037,811
Agriculture Systems and Technology			
Nanotechnology for Agricultural and Food Systems	86	9	3,880,342
Engineering Products and Processes	114	11	5,094,012
National Robotics Initiative	4	4	3,000,000
Agricultural Economics and Rural Communities			
Entrepreneurship and Small Business Development	23	0	0
Environment	46	7	2,822,904
Markets and Trade	63	9	3,203,360
Rural Development	40	8	3,946,573
Small and Medium-Sized Farms	58	8	3,855,446
Critical Agricultural Research and Extension (CARE) Program			
CARE	57	0	0
Exploratory Program			
Exploratory Research	75	0	0
Challenge Areas			
Childhood Obesity Prevention			
Integrated Research, Education, and Extension to Prevent Childhood Obesity	104	30	\$17,078,347
Transdisciplinary Graduate Education and Training in Nutrition and Family Sciences or Child Development or Related Fields to Prevent Childhood Obesity	4	4	3,375,033
Community-Based Childhood Obesity Prevention	1	1	4,967,049

TABLE 4: FUNDING BY PROGRAM (CONTINUED)

Foundational Programs	Number of Applications	Number of Awards	Fiscal Year 2014 Funding
Challenge Areas (Continued)			
Climate Change			
Climate Change Mitigation and Adaptation in Agriculture	12	12	9,887,261
Impacts of Climate Change on Animal Health and Production	1	1	500,000
Interagency Climate Change	10	4	4,928,696
Interagency Climate Change - NASA	17	13	5,068,337
National Cereal Germplasm Phenotyping	1	1	5,000,000
Regional Approaches to Climate Change	4	4	14,000,000
Food Safety			
Effective Mitigation Strategies for Antimicrobial Resistance	31	7	6,724,887
Enhancing Food Safety Through Improved Processing Technologies	35	7	3,900,696
Identifying and Targeting Critical Food Safety Needs	5	1	50,000
Prevention, Detection, and Control of Food-borne Viruses in Food: A Focus on Noroviruses	1	1	3,309,602
Prevention and Control of <i>Salmonella</i> and <i>Campylobacter</i> in Poultry Flocks and Poultry Products, Including Eggs	4	4	2,000,000
Prevention, Detection, and Control of Shiga toxin-producing <i>Escherichia coli</i> (STEC) from Pre-Harvest through Consumption in Beef Products	1	1	4,996,253
Global Food Security			
Extension-Driven Disease Prevention and Control in Animals	2	2	1,138,947
Improved Sustainable Food Systems to Reduce Hunger and Food Insecurity Domestically and Globally	11	11	8,511,692
Improving Sustainability by Improving Feed Efficiency of Animals	3	1	962,500
Translational Genomics for Improved Fertility of Animals	1	1	1,794,047
Management of Arthropod-or Nematode-Vectored Plant Pathogens	1	2	1,425,000
Minimizing Diseases due to Fungal Pathosystems	2	3	3,241,666
Minimizing Losses from Dairy Diseases with Major Impact on Production, Marketing, and/or Trace	1	1	1,950,000
Minimizing Losses from Pests and Diseases of Livestock	23	3	2,987,464
Mitigating Crop and Livestock Losses	34	5	2,537,630
Oomycete Pathosystems in Crop Plants to Minimize Disease	2	2	3,705,000
Program Delivery and Implementation of Wide-area Pest Monitoring	1	1	1,170,000
Translational Genomics for Disease Resistance in Animals	3	3	1,733,673
Sustainable Bioenergy			
Development and Sustainable Production of Regionally Appropriate Biomass Feedstocks, AFRI	7	7	31,489,667
Investing in America's Scientific Crops: Stimulating a New Era of Students and Faculty in Bioenergy	2	2	1,983,841
National Loblolly Pine	1	1	2,925,000
Plant Feedstock Genomics for Bioenergy	2	2	2,000,000
Water for Agriculture			
Water for Agriculture	88	14	6,000,000
NIFA Fellowships			5,969,627
Pre-Doctoral Fellowships	154	27	1,853,128
Post-Doctoral Fellowships	207	28	4,116,499
Grand Total			
	3,151	467	\$269,975,863

TABLE 5: TOTAL DOLLARS AND PERCENT OF FUNDING FOR DIMENSIONS OF FY 2014 AFRI AWARDS

Award Dimension	Funding	%
Fundamental Research Mission-Linked	\$126,703,928	49
Applied Research	133,697,202	51
Multi-Disciplinary	192,105,851	74
Single Discipline	65,901,754	26
Integrated Research		
Research, Education, and Extension	122,564,150	46
Research and Education	20,131,194	8
Research and Extension	13,559,355	4
Education and Extension	174,502	0
Single Function Projects		
Research	104,146,431	39
Education	4,426,368	2
Extension	3,048,766	1

TABLE 6: NUMBER AND TOTAL DOLLARS OF FY 2014 AWARDS PROVIDED FOR EACH CATEGORY FASE GRANT

Award Type	Number	Funding
Post-Doctoral Fellowships	28	\$4,116,499
Pre-Doctoral Fellowships	27	1,853,128
New Investigator Awards	11	3,373,852
Strengthening Awards		
Research Career Enhancement Awards	3	246,685
Equipment Grants	7	281,832
Seed Grants	25	3,714,774
Standard Strengthening Research Project Awards	13	5,951,260
Strengthening Coordinated Agricultural Projects	4	5,000,739
Total	118	24,638,769

TABLE 7: CROSS-CUTTING AREAS OF SCIENCE IMPORTANT TO AFRI AND USDA

Award Type	Number	Funding
Animal Genome	22	\$13,032,140
Animal Health	69	41,533,357
Food Safety	43	30,141,920
Forest Biology	20	22,715,152
Global Change	58	46,441,317
Integrated Pest Management	30	17,919,164
Plant Genome	22	16,277,428
Sustainable Agriculture	74	65,040,455
Water Quality	20	8,380,554

TABLE 8: APPLICATIONS BY TYPE OF INSTITUTION

Type of Institution	% of Applications Submitted	% of Applications Awarded	% of Total Dollars Awarded
Land Grant University			
1862 Land-Grant University	75.38	79.44	84.17
1890 Land-Grant University (including Tuskegee)	3.43	2.36	1.33
1994 Land-Grant University	0.29	0.00	0.00
Public Non-Land-Grant University or College	5.87	5.35	6.01
Private University or College	5.55	5.78	3.83
Federal Agency/Department	3.18	2.57	2.06
Industry/Other*	6.31	4.49	2.59

*Includes Non-Federal Government, Private For-Profit, and Other Entities

TABLE 9: NUMBER AND LENGTH OF TIME OF UNDERGRADUATE, GRADUATE, AND POST-DOCTORAL JOBS PROVIDED BY AFRI FY 2014 AWARDS

Program	Supported	Graduate Students	Post-Doctoral Students	Undergraduate Students	Subtotal
Foundational Programs					
Plant Health and Production and Plant Products	Number Months	60 1,433	38 999	35 484	133 2,916
Animal Health and Production and Animal Products	Number Months	31 681	28 577	10 91	69 1,349
Food Safety, Nutrition, and Health	Number Months	45 1,051	6 161	9 144	60 1,356
Bioenergy, Natural Resources, and Environment	Number Months	16 413	34 108	18 87	68 608
Agriculture Systems and Technology	Number Months	44 880	10 215	8 133	62 1,228
Agriculture Economics and Rural Communities	Number Months	35 668	4 37	17 123	56 828
Exploratory Research Program	Number Months	0 0	0 0	0 0	0 0
Critical Agricultural Research and Extension	Number Months	0 0	0 0	0 0	0 0
Challenge Area Programs					
Sustainable Bioenergy	Number Months	31 231	23 182	39 131	93 544
Climate Change	Number Months	282 2,222	83 965	129 588	494 3,775
Food Safety	Number Months	109 1,174	98 744	43 649	250 2,567
Global Food Security	Number Months	122 1,970	36 688	156 745	314 3,403
Childhood Obesity Prevention	Number Months	94 1,295	6 200	130 761	230 2,256
Water for Agriculture	Number Months	12 119	4 48	7 36	23 203
Fellowships					
NIFA Fellowships	Number Months	27 580	28 670	0 0	55 1,250
Total	Number Months	908 12,717	398 5,594	601 3,972	1,907 22,283

TABLE 10: SCIENTIFIC SUBJECT AREAS STUDIED BY AFRI PROJECTS

Scientific Area Studied	Total AFRI Funding
Natural Resources	\$36,817,409
Forestry	23,758,218
Crops	65,212,027
Animals	50,610,188
People, Communities, and Rural Development	15,997,115
Competition, Trade, Adjustment, Price, and Income	5,852,318
General Resource or Technology	5,256,593
Food Sciences and Human Nutrition	51,432,035
Other	889,253
Grand Total	\$255,825,156