



United States
Department of
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National Institute
of Food and
Agriculture

AFRI

Agriculture and Food Research Initiative

2009 Annual Synopsis

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Program Overview

The Food, Conservation and Energy Act of 2008, otherwise known as the 2008 Farm Bill, established the Agriculture and Food Research Initiative (AFRI), which assumed all of the authorities of its predecessor program, the National Research Initiative. AFRI is the premier agricultural competitive grants program in the United States. The program is authorized through fiscal year (FY) 2012 to fund high priority research, education, and extension competitive grants that address food and agricultural sciences.

Competitive Program Solicitation

Fiscal year (FY) 2009 was the first year that AFRI solicited competitive grant applications. Forty programs solicited applications in FY 2009 addressing the areas of: 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. A total of 2,424 competitive grant applications, requesting \$1,094,795,985, were received and reviewed through a competitive peer review process (Table 1).

Peer Review Panel Characteristics

Over 500 experts from across the country participated in peer review panel evaluations to help select the most meritorious projects for funding. 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, as well as gender and minority status. A breakdown of panel member characteristics is shown in Table 2. Additional expertise was brought to proposal evaluation by a number of scientists and other specialists through *ad hoc* reviews.

Table 1. The number of FY 2009 AFRI applications and total dollars requested, recommended for funding, and awarded.

| Applications | Number | Dollars |
|--------------|--------|---------------|
| Requested | 2335 | 1,062,748,261 |
| Recommended | 835 | 704,323,465 |
| Awarded | 470 | 176,412,216 |

Table 2. Characteristics of FY 2009 AFRI peer review panelists by number and percent.

| Characteristic | Number | Percent |
|---------------------------------------|------------|---------|
| Geographic Region | | |
| Northeast | 111 | 21.5% |
| North Central | 148 | 28.6% |
| Southern | 160 | 30.9% |
| Western | 98 | 19.0% |
| Type of Institution* | | |
| Land Grant University | | |
| 1862 Land Grant University | 313 | 60.5% |
| 1890 Land Grant University | 28 | 5.4% |
| 1994 Land Grant University | 0 | 0.0% |
| Hispanic Serving | 16 | 3.1% |
| Public non-Land Grant | 52 | 10.1% |
| Private College/University | 22 | 4.3% |
| Private Research | 8 | 1.5% |
| Federal | 56 | 10.8% |
| Industry/Other | 24 | 4.6% |
| Type of Position | | |
| Professor | 149 | 28.8% |
| Associate Professor | 130 | 25.1% |
| Assistant Professor | 139 | 26.9% |
| Federal | 57 | 11.0% |
| Industry | 20 | 3.9% |
| Other (Senior Lecturer) | 22 | 4.3% |
| Expertise Representation | | |
| Researcher | 337.6 | 65.3% |
| Educator | 108.19 | 20.9% |
| Extension Educator | 35.98 | 7.0% |
| Other | 35.23 | 6.8% |
| Gender/Minority Representation | | |
| Non-minority Male | 228 | 44.1% |
| Non-minority Female | 144 | 27.9% |
| Minority Male | 100 | 19.3% |
| Minority Female | 45 | 8.7% |
| Total Panelists | 517 | |

*Eighty panelists represented USDA EPSCoR states and 61 panelists represented Small and Mid-sized Institutions.

Funding Portfolio

Success Rate - Awards totaling \$176,412,216 were made to the 470 highest-ranked applications. Table 3 (pages 4-5) shows the number of awards and total dollars awarded for each AFRI program area. An additional 365 proposals were recommended for funding by review panels and could have been supported provided an additional \$528 million was available to the program. The success rate for AFRI applications, calculated in terms of number of proposals funded excluding conferences, supplements, and continuing increments of the same grant divided by the number of proposals submitted for review, was approximately 18 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. See Table 4 for a breakdown of the total dollars and percent of support to each type. The mean award size for research projects was \$398,096 for 2.8 years, excluding Food and Agricultural Science Enhancement Grants and Conference Grants. These excluded grant types are often shorter in duration and have lower budget limitations than do standard research awards.

Table 4. The total dollars and percent of funding for dimensions of FY 2009 AFRI awards.

| Award Dimension | Dollars | Percent |
|---|-------------|---------|
| Fundamental Research | 105,737,333 | 60 |
| Mission-linked Applied Research | 70,674,883 | 40 |
| Multi-disciplinary | 121,661,048 | 69 |
| Single Discipline | 54,751,168 | 31 |
| Integrated Research, Education, and Extension | 51,547,894 | 30 |
| Single Function Research | 120,536,102 | 68 |
| Single Function Education | 3,499,579 | 2 |
| Single Function Extension | 828,641 | <1 |

Integrated awards comprised 30 percent of the 2009 funding portfolio (table 4). These projects bring together at least two of the three components of the agricultural knowledge system (e.g., research, education, and extension). Integrated projects hold the greatest potential to produce, transfer, and apply knowledge directly to end users, while providing educational opportunities to assure the development of agricultural expertise in future generations. The average award for integrated projects was \$608,730 for 3.0 yrs, excluding Food and Agricultural Science Enhancement Grants and Conference Grants. This mean includes Coordinated Agriculture Projects, which 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.

AFRI provided funds totaling \$407,500 in support of 37 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.

Fundamental and Mission-Oriented Research - Sixty 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 40 percent to fund applied work to address specific problems, needs, or opportunities in modern society (Table 4).

Multidisciplinary Awards - 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. As shown in Table 4, 69 percent of AFRI awards made in 2009 will be conducted by multidisciplinary teams.

Table 3. The number of awards and total dollars awarded for each AFRI program by area in FY 2009.

| Program Name | Number | Dollars |
|--|---------------|----------------|
| Plant Health and Production and Plant Products | | |
| Applied Plant Genomics Coordinated Agricultural Project (CAP) | 4 | 4,455,000 |
| Arthropod and Nematode Biology and Management: Organismal and Population Biology | 19 | 5,561,463 |
| Arthropod and Nematode Biology and Management: Protection of Managed Bees | 1 | 1,000,000 |
| Arthropod and Nematode Biology and Management: Suborganismal Biology | 12 | 3,402,862 |
| Arthropod and Nematode Biology and Management: Tools, Resources, and Genomics | 12 | 3,535,675 |
| Microbial Genomics: Functional Genomics of Microorganisms | 7 | 6,000,000 |
| Microbial Genomics: Genome Sequencing | 7 | 5,000,000 |
| Microbial Biology: Microbial Associations with Plants | 22 | 7,400,000 |
| Plant Biology: Biochemistry | 17 | 4,255,000 |
| Plant Biology: Environmental Stress | 16 | 3,966,921 |
| Plant Biology: Growth and Development | 15 | 3,997,000 |
| Plant Biosecurity | 8 | 4,144,706 |
| Plant Breeding and Education | 12 | 5,993,248 |
| Plant Genome, Genetics and Breeding | 18 | 6,002,545 |
| <i>Subtotal</i> | 170 | 64,714,420 |
| Animal Health and Production and Animal Products | | |
| Animal Biosecurity CAP* | 0 | - |
| Animal Genome, Genetics and Breeding | 20 | 11,000,000 |
| Animal Growth and Nutrient Utilization | 16 | 4,496,250 |
| Animal Health and Well-Being: Animal Health | 18 | 4,691,000 |
| Animal Health and Well-Being: Animal Well-Being | 17 | 5,712,000 |
| Animal Health and Well-Being: Tools and Resources | 3 | 672,000 |
| Animal Reproduction | 18 | 4,500,000 |
| Integrated Solutions for Animal Agriculture | 5 | 4,000,000 |
| <i>Subtotal</i> | 97 | 35,071,250 |
| Food Safety, Nutrition, and Health | | |
| Bioactive Food Components for Optimal Health | 14 | 5,068,357 |
| Food Safety and Epidemiology: Biological Approaches for Food Safety | 17 | 5,322,487 |
| Food Safety and Epidemiology: Epidemiological Approaches for Food Safety Solutions | 4 | 4,577,639 |
| Food Safety and Epidemiology: Practical Approaches for Food Protection | 1 | 299,874 |
| Human Nutrition and Obesity | 11 | 11,000,000 |
| Improving Food Quality and Value | 18 | 5,643,971 |
| <i>Subtotal</i> | 65 | 31,912,328 |

Table 3 Continued

| Program Name | Number | Dollars |
|---|------------|--------------------|
| Renewable Energy, Natural Resources, and Environment | | |
| Air Quality | 11 | 5,301,915 |
| Biology of Weedy and Invasive Species in Agroecosystems | 13 | 4,600,000 |
| Enhancing Ecosystem Services from Agricultural Lands: Management, Quantification, and Developing Decision Support Tools** | 0 | - |
| Global and Climate Change | 7 | 3,340,013 |
| Managed Ecosystems | 15 | 4,029,902 |
| Soil Processes | 20 | 4,348,068 |
| Sustainable Agroecosystem Science LTAP | 5 | 999,326 |
| Water and Watersheds | 15 | 4,300,000 |
| <i>Subtotal</i> | 86 | 26,919,224 |
| Agriculture Systems and Technology | | |
| Biobased Products and Bioenergy Production Research | 20 | 7,395,000 |
| Nanoscale Science and Engineering for Agriculture and Food Systems* | 0 | - |
| <i>Subtotal</i> | 20 | 7,395,000 |
| Agriculture Economics and Rural Communities | | |
| Agribusiness Markets and Trade | 16 | 4,600,000 |
| Agricultural Prosperity for Small and Medium-sized Farms | 13 | 4,800,000 |
| Rural Development* | 0 | - |
| <i>Subtotal</i> | 29 | 9,400,000 |
| Other | | |
| Rapid Response Food and Agricultural Science for Emerging Issues | 2 | 499,994 |
| Interagency Metabolic Engineering | 1 | 500,000 |
| <i>Subtotal</i> | 3 | 999,994 |
| Grand Total | 470 | 176,412,216 |

*The program did not solicit proposals in FY 2009.

**Awards made from the Enhancing Ecosystem Services from Agricultural Lands: Management, Quantification, and Developing Decision Support Tools Program are counted in the total for the Global and Climate Change Program.

Broadening the Funding Portfolio - AFRI offers Food and Agricultural Science Enhancement (FASE) Grants designed 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

Table 5. The number and total dollars of FY 2009 awards awarded for each category of Food and Agricultural Science Enhancement (FASE) Grants.

| Type of Award | Number | Dollars |
|---|------------|-------------------|
| Post Doctoral Fellowships | 13 | 1,623,516 |
| New Investigator Awards | 27 | 11,648,208 |
| Strengthening Awards | | |
| Research Career Enhancement Awards | 1 | 99,775 |
| Equipment Grants | 7 | 189,182 |
| Seed Grants | 30 | 4,109,848 |
| Standard Strengthening Research Project Awards* | 51 | 21,847,437 |
| Total | 129 | 39,517,966 |

*Thirty additional grants totaling \$9,138,396 were awarded to institutions eligible for, but not funded as, Standard Strengthening Research Projects Awards.

states in which institutions have been less successful in receiving AFRI funding (these states are identified by NIFA as Experimental Program for Stimulating Competitive Research, EP-SCoR, states). In FY 2009, approximately 22% of AFRI funds supported FASE grants. A breakdown of FASE awards is found in Table 5.

Transcending Topic Areas - AFRI makes awards that span several topics of major importance to USDA. Table 6 lists these crosscutting areas and identifies the number of awards and total amount of funding for each area.

Institution Types - AFRI engages a broad range of institution types including Land Grant Universities (1862, 1890, and 1994), Public Non-Land Grant Universities, Private Colleges and Universities, Private Research Foundations, Federal Institutions, and Industry. A breakdown of submitted applications, funded applications, and FY 2009 dollars awarded is provided by institution type in Table 7.

Training - Competitive grants administered by AFRI provide support to train the next generation workforce for agriculture. In 2009, AFRI provided funding for over 1,000 students and post-doctorates for over 1,600 years when added together. Table 8 provides an overview of student and post-doctoral support provided by programs areas within AFRI.

Table 6. The number of awards and total amount of funding for crosscutting areas of major importance to AFRI and USDA in FY 2009.

| Areas | Number | Dollars |
|----------------------------|--------|------------|
| Animal Genome | 25 | 13,610,000 |
| Animal Health | 55 | 20,765,459 |
| Food Safety | 34 | 13,605,020 |
| Forest Biology | 23 | 9,720,651 |
| Global Change | 36 | 10,709,654 |
| Integrated Pest Management | 46 | 19,419,480 |
| Plant Genome | 26 | 12,493,767 |
| Sustainable Agriculture | 44 | 14,032,181 |
| Water Quality | 29 | 8,850,356 |

Table 7. The percent of applications submitted, applications awarded, and total funds awarded by institution type for AFRI in FY 2009.

| Type of Institution | Percent of Applications Submitted | Percent of Applications Awarded | Percent of Total Dollars Awarded |
|----------------------------|-----------------------------------|---------------------------------|----------------------------------|
| Land Grant University | | | |
| 1862 Land Grant University | 76.2 | 74.5 | 74.4 |
| 1890 Land Grant University | 1.5 | 0.9 | 0.8 |
| 1994 Land Grant University | 0.1 | 0.0 | 0.0 |
| Public non-Land Grant | 7.8 | 6.8 | 5.4 |
| Private College/University | 5.2 | 6.4 | 9.7 |
| Private Research | 3.8 | 5.3 | 3.6 |
| Federal | 4.6 | 5.7 | 5.8 |
| Industry/Other | 0.9 | 0.4 | 0.4 |

Table 8. The number and length of time of undergraduate, graduate, and postdoctoral support provided by AFRI FY 2009 awards.

| Program | Number Supported | Months of Support |
|--|-------------------------|--------------------------|
| Agriculture Economics and Rural Communities | | |
| Undergraduate Students | 10 | 58 |
| Graduate Students | 33 | 747 |
| Postdoctoral Researchers | 2 | 7 |
| <i>Subtotal</i> | 45 | 812 |
| Agriculture Systems and Technology | | |
| Undergraduate Students | 13 | 179 |
| Graduate Students | 37 | 762 |
| Postdoctoral Researchers | 7 | 162 |
| <i>Subtotal</i> | 57 | 1,103 |
| Animal Health and Production and Animal Products Total | | |
| Undergraduate Students | 28 | 521 |
| Graduate Students | 63 | 1,799 |
| Postdoctoral Researchers | 39 | 996 |
| <i>Subtotal</i> | 130 | 3,316 |
| Food Safety, Nutrition, and Health | | |
| Undergraduate Students | 35 | 257 |
| Graduate Students | 149 | 2,624 |
| Postdoctoral Researchers | 21 | 439 |
| <i>Subtotal</i> | 205 | 3,320 |
| Other (Rapid Response and Metabolic Engineering Programs) | | |
| Undergraduate Students | 2 | 6 |
| Graduate Students | 3 | 45 |
| Postdoctoral Researchers | 1 | 36 |
| <i>Subtotal</i> | 6 | 87 |
| Plant Health and Production and Plant Products | | |
| Undergraduate Students | 194 | 1,831 |
| Graduate Students | 158 | 3,560 |
| Postdoctoral Researchers | 102 | 2,686 |
| <i>Subtotal</i> | 454 | 8,077 |
| Renewable Energy, Natural Resources, and Environment | | |
| Undergraduate Students | 62 | 697 |
| Graduate Students | 85 | 1,933 |
| Postdoctoral Researchers | 21 | 417 |
| <i>Subtotal</i> | 168 | 3,047 |
| All Programs | | |
| Undergraduate Students | 342 | 3,563 |
| Graduate Students | 526 | 11,380 |
| Postdoctoral Researchers | 191 | 4,736 |
| Total | 1,059 | 19,679 |