

# Agriculture and Food Research Initiative Competitive Grants Program

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**MODIFICATION: PAGE 20**

## Foundational Program

***FY 2013 Request for Applications***



United States  
Department of  
Agriculture

National Institute  
of Food and  
Agriculture

**NATIONAL INSTITUTE OF FOOD AND AGRICULTURE  
U.S. DEPARTMENT OF AGRICULTURE**

**AGRICULTURE AND FOOD RESEARCH INITIATIVE  
COMPETITIVE GRANTS PROGRAM  
FOUNDATIONAL PROGRAM**

**INITIAL ANNOUNCEMENT**

**CATALOG OF FEDERAL DOMESTIC ASSISTANCE:** This program is listed in the Catalog of Federal Domestic Assistance (CFDA) under 10.310.

**DATES:** Applications must be submitted via Grants.gov by 5:00 p.m. Eastern Time (ET) on the deadline date indicated in the Program Area Descriptions section beginning in Part I, C. See Part IV, F “Other Submission Requirements” for a full description of what it means to submit an application on time. Applications received after the deadline will normally not be considered for funding. Comments regarding this request for applications (RFA) are requested within six months from the issuance of this notice. Comments received after this date will be considered to the extent practicable.

**STAKEHOLDER INPUT:** The National Institute of Food and Agriculture (NIFA) is requesting comments regarding this RFA from any interested party. These comments will be considered in the development of the next RFA for the program, if applicable, and will be used to meet the requirements of section 103(c)(2) of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7613(c)(2)). This section requires the Secretary to solicit and consider input on a current RFA from persons who conduct or use agricultural research, education, and extension for use in formulating future RFAs for competitive programs. Written stakeholder comments directed toward this RFA should be submitted in accordance with the deadline set forth in the DATES portion of this notice.

Written stakeholder comments should be submitted by mail to: Policy and Oversight Division; Office of Grants and Financial Management; National Institute of Food and Agriculture; USDA; STOP 2299; 1400 Independence Avenue, SW; Washington, DC 20250-2299; or via e-mail to: [Policy@nifa.usda.gov](mailto:Policy@nifa.usda.gov) (This e-mail address is intended only for receiving comments regarding this RFA and not for requesting information or forms). In your comments, please state that you are responding to the Agriculture and Food Research Initiative Foundational Program RFA. Stakeholder comments received in response to the fiscal year (FY) 2011 Foundational RFA and FY 2012 Challenge Area RFAs are discussed in Part I, B. of this RFA.

**EXECUTIVE SUMMARY:** The U.S. Department of Agriculture (USDA) established the Agriculture and Food Research Initiative (AFRI) under which the Secretary of Agriculture may make competitive grants for fundamental and applied research, education, and extension to address food and agricultural sciences (as defined under section 1404 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA) (7 U.S.C. 3103)), as amended, in six priority areas. The six priority areas include: 1) plant health and production and plant products; 2) animal health and production and animal products; 3) food safety, nutrition, and health; 4) renewable energy, natural resources, and environment; 5) agriculture systems and technology; and 6) agriculture economics and rural communities.

**NOTE:** This RFA is being released prior to the passage of an Appropriations Act for FY 2013. Enactment of an Appropriations Act may affect the overall level of funding for the AFRI program. Therefore, NIFA reserves the right to amend, delete, or alter any programs outlined in this RFA.

In FY 2013, subject to availability of funds, approximately \$264 million will be available to support the AFRI program. Of this amount, no less than 30 percent will be made available to fund integrated research, education, and extension programs.

For FY 2013, subject to availability of funds, it is anticipated that approximately \$136 million will be made available to support new awards within the AFRI Foundational Program Area. This RFA focuses on

building a foundation of knowledge in fundamental and applied food and agricultural sciences critical for solving current and future societal challenges.

Project types supported by AFRI within this RFA include single-function Research Projects, multi-function Integrated Projects, and Food and Agricultural Science Enhancement (FASE) Grants. This RFA identifies research and integrated program objectives, eligibility criteria, and matching requirements for each project type.

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## **PART I – FUNDING OPPORTUNITY DESCRIPTION**

### **A. Legislative Authority and Background**

Section 7406 of the Food, Conservation, and Energy Act of 2008 (FCEA) (Pub. L. 110-246) amends section 2(b) of the Competitive, Special, and Facilities Research Grant Act (7 U.S.C. 450i(b)) to authorize the Secretary of Agriculture to establish the Agriculture and Food Research Initiative (AFRI); a competitive grant program to provide funding for fundamental and applied research, education, and extension to address food and agricultural sciences. Grants shall be awarded to address priorities in United States agriculture in the following areas:

1. Plant health and production and plant products;
2. Animal health and production and animal products;
3. Food safety, nutrition, and health;
4. Renewable energy, natural resources, and environment;
5. Agriculture systems and technology; and
6. Agriculture economics and rural communities.

To the maximum extent practicable, the National Institute of Food and Agriculture (NIFA), in coordination with the Under Secretary for Research, Education, and Economics (REE), will make grants for high priority research, education, and extension, taking into consideration, when available, the determinations made by the National Agricultural Research, Extension, Education, and Economics Advisory Board (NAREEEAB) pursuant to section 2(b)(10) of the Competitive, Special, and Facilities Research Grant Act (7 U.S.C. 450i(b)(10)), as amended. The authority to carry out this program has been delegated to NIFA through the Under Secretary for REE.

### **B. Purpose and Priorities**

The purpose of AFRI is to support research, education, and extension work by awarding grants that address key problems of national, regional, and multi-state importance in sustaining all components of food and agriculture, including farm efficiency and profitability, ranching, renewable energy, forestry (both urban and agroforestry), aquaculture, rural communities and entrepreneurship, human nutrition, food safety, physical and social sciences, home economics and rural human ecology, biotechnology, and conventional breeding. Through this support, AFRI advances knowledge in both fundamental and applied sciences important to agriculture. It also allows AFRI to support education and extension activities that deliver science-based knowledge to people, allowing them to make informed practical decisions. This AFRI RFA is announcing funding opportunities for fundamental Research, applied Research, and Integrated Research, Education, and/or Extension Projects.

Supporting the many components of agriculture under the constraints of a growing population, pressure on natural resources, and the challenges of climate variability and change, requires research, education, extension, and integrated programs that increase agricultural and natural resource sustainability. The term "sustainable agriculture" (NARETPA, 7 U.S.C. 3103) means an integrated system of plant and animal production practices having a site-specific application that will over the long-term achieve the following goals: 1) satisfy human food and fiber needs; 2) enhance environmental quality and the natural resource base upon which the agriculture economy depends; 3) make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls; 4) sustain the economic viability of farm operations; and 5) enhance the quality of life for farmers and society as a whole.

The National Research Council Committee on Twenty-First Century Systems Agriculture recently updated and simplified this definition as a four-part goal: satisfy human food, feed, and fiber needs and contribute to biofuel needs; enhance environmental quality and the resource base; sustain the economic viability of agriculture; and enhance the quality of life for farmers, farm workers, and society as a whole. The Committee states that progress toward these goals will require robust systems which adapt to and continue to function in the face of stresses, are productive, use resources efficiently, and balance all four

goals across all scales of farms and enterprises. They further state that if the U.S. is to maintain adequate resources to meet food, feed, fiber, and biofuel needs, progress toward meeting the four goals must be accelerated. This acceleration must be based on research that determines ways to reduce tradeoffs and enhance synergies among the four goals while managing risks associated with their pursuit. The Committee's 2010 report, *Toward Sustainable Agricultural Systems in the 21<sup>st</sup> Century*, provides a review of the contributions of farming practices and systems; and fields of science that elaborates on these general goals with respect to many of the specific priorities within AFRI programs.

AFRI is intended to promote advances in U.S. food, agriculture and forestry. Agriculture, however, is increasingly worldwide in scope and reach. To attain AFRI's goals for U.S. food and agriculture, applicants to Foundational or Challenge Area RFAs may include international partnerships or engagement in proposals, as appropriate. Applicants are asked to keep in mind that while international activities supported by AFRI may contribute to global food security, as described in the U.S. Government's Feed the Future global food security initiative ([www.feedthefuture.gov](http://www.feedthefuture.gov)), any international activity proposed under AFRI such as partnerships, exchanges, training, travel, etc., must first and foremost support AFRI's domestic program goals. Applicants must clearly describe and demonstrate how international activities proposed in applications submitted to AFRI will contribute to and support advances in American agriculture.

If international activities (e.g., partnerships, exchanges, travel, etc.) are proposed, then applicants shall describe indicators that will be used to assess those activities. Appropriate indicators include but are not limited to those posted at the U.S. Government's Feed the Future global food security initiative Web site ([www.feedthefuture.gov/progress](http://www.feedthefuture.gov/progress)).

#### **Stakeholder Input**

The programs described herein were developed within the context of the authorized purposes of USDA research, extension, and education projects and activities. In addition, AFRI obtains input from Congress, the NAREEEAB, as well as many university, scientific, and agricultural committees and organizations. NIFA developed a stakeholder's Web page ([www.nifa.usda.gov/business/reporting/stakeholder.html](http://www.nifa.usda.gov/business/reporting/stakeholder.html)) to document stakeholder input that is considered when developing and updating Program Area Descriptions and Priorities each year.

The AFRI program was significantly restructured and refocused in FY 2010 to more effectively address societal challenges while continuing to support foundational agricultural science. A public meeting was held on June 2, 2010, to seek stakeholder comment on the FY 2010 AFRI RFAs prior to revising them for FY 2011. NIFA has once again solicited stakeholder input via a public meeting and 12 program-specific webinars. The public meeting was held on February 22, 2012, and the webinars were held during the months of March and April, 2012. NIFA received more than 145 comments from stakeholders, including a wide range of scientific societies, producer associations, universities and other research organizations, policy and advocacy groups, non-profit organizations, and leading scientists in the field of agriculture and food sciences. Collectively, the non-governmental organizations represented over 300,000 stakeholders of interest. A comprehensive analysis was conducted of the written and oral stakeholder input comments received. Categorically, these comments can be clustered into the following: Production Agriculture; Food Safety; Energy, Environment, Natural Resources, and Rural Communities; Bioengineering, Biochemistry, and Plant Health; Health and Obesity; Grant-making; and Animal Agriculture and Aquaculture.

In general, the broad range of AFRI stakeholders provided overwhelming support for NIFA and the AFRI program. During the in-person stakeholder listening session, 100 percent of the speakers expressed their appreciation for the event and the opportunity to participate. It should be noted that hundreds of e-mails were received from stakeholders indicating their regrets of not being able to attend due to other commitments, the short notification, and lack of financial resources. Overall, stakeholders applauded NIFA for expending the time, effort, and resources to facilitate sessions designed to obtain their feedback, comments, and being responsive to stakeholder input. In addition, almost ten percent of the stakeholders specifically expressed their gratitude for the Administration, USDA, and NIFA's request for an increase in funding for the AFRI program in the FY 2013 budget. Moreover, many supported full funding of the AFRI program to the level authorized in the 2008 Farm Bill. Stakeholders with current and past AFRI projects

expressed their appreciation of the goals and mission of the AFRI program. The stakeholders applauded NIFA for its leadership in taking on the diverse, global agricultural and food science issues. In addition, a significant proportion of the stakeholders, 40 percent, expressed in great detail the level of their gratitude of AFRI as a funding source, the competitive grants process, efforts to ensure that AFRI Challenge Area RFAs include basic research and relevant scientific disciplines. Lastly, stakeholders articulated their support for NIFA's partnership initiatives including inter-agency and public-private efforts.

Stakeholder concern exists regarding NIFA's compliance with AFRI authorizing language, the scientifically confining aspects of the RFAs, the funding amount and allocations between the foundational and challenge areas, the benefit and efficacy of Coordinated Agricultural Project (CAP) grants, and the overall AFRI program/project types that are under/not funded. Stakeholders expressed trepidation regarding the eligibility criteria for integrated projects that exclude entities beyond colleges and universities as primary recipients. Also, stakeholders felt that the funding level of the Foundational Program was inadequate and indicated support of an allocation level of up to 50 percent of the AFRI appropriation for that part of the program. Other stakeholders provided input regarding specific AFRI set-aside amounts for program/projects, e.g., organic, classical breeding, water, and biotechnology. Overall, 30 percent of stakeholders expressed concern that CAP grants are too large. While many of the stakeholders expressed an understanding of the concept and benefit of CAP grants to long-term, interdisciplinary, scientific research, stakeholders encouraged NIFA to reconsider and balance the portfolio and funds attributed to these types of projects. Additionally, stakeholders expressed concerns regarding the overall AFRI program, as it pertains to decisions that eliminate and/or reduce single-investigator, hypothesis-driven scientific discovery, junior faculty award success rates, qualified and diverse panel reviewers, and a disconnect between industry and higher education scientific research.

Stakeholders provided an abundance of recommendations that are proactive and designed to have immediate, beneficial outcomes. The recommendations included the need for NIFA to define its agricultural identity among the federal agencies, improvements to the AFRI Program, current and future investments, and the development of RFAs. Some stakeholders indicated that NIFA was duplicative and/or undistinguishable in its research efforts associated with other federal agencies. However, they were supportive of the need and benefit of leveraging limited resources through inter-agency partnerships. Stakeholders expressed the need for more, smaller innovative awards in the amount of \$1 million dollars and restricting the size of CAP awards to \$10 to \$20 million. Lastly, the recommendations regarding RFAs included expanding and/or clarifying the restrictive language, allowing adequate time to prepare a responsive, comprehensive proposal, systematic and consistent publishing, and associating the request for information to match the size of the award.

In response to the comments received, NIFA will take several actions. The AFRI program will undergo a rigorous external evaluation during the next 24 months to examine a number of issues around NIFA's administration of the program and to assess the quality of the work being supported. Based on the recommendations of the evaluation, as well as comments from stakeholders, NIFA will make changes to program offerings, make adjustments to award sizes, and reconsider the distribution of funds between Challenge Areas and the Foundational Program. The rate at which these changes will occur will depend, in part, on available funding.

NIFA understands that some stakeholders are concerned about priority limitations identified in the AFRI RFAs. NIFA has focused on making critical but essential decisions regarding the scientific reach and impact for each RFA that is published. These decisions included the identification of five Challenge Areas that are relevant and consistent with the priority areas identified in the AFRI legislation. Moreover, these decisions are guided by 2008 Farm Bill, National Agricultural Research, Extension, Education, and Economics Advisory Board, USDA Strategic Plan, Research, Education, and Economics Action Plan, NIFA Strategic Plan, pertinent industry-related scientific reports, and stakeholder input. In the end, the RFAs reflect a comprehensive, consultative document to address the collective needs of specific scientific issues that notably impact America's agricultural and food system.

Within the stakeholder community, there is a fair amount of concern regarding NIFA's agricultural identity among the federal agencies, specifically as it applies to addressing childhood obesity prevention. NIFA



emphasizes the role of foods and whole diets in the prevention of chronic degenerative diseases, while the National Institutes of Health, in general, addresses therapeutic aspects. Successful applications to AFRI must align with USDA and NIFA mission, strategic plans, and goals. Moreover, the existing REE Action Plan encourages the formal and informal collaboration with other USDA and Federal agencies, as well as public and private partners. The focus of these partnerships is on a national and international level to ensure our research, education, and extension activities that are representative of current priorities and take advantage of existing knowledge.

NIFA acknowledges the level of concern that exists within a portion of the stakeholder community regarding entities eligible to submit applications for integrated projects. Eligibility for all NIFA programs is established in authorizing legislation. Eligibility to apply to the AFRI program was established in the 2008 Farm Bill and NIFA has adhered to that requirement. Applicants not eligible to directly apply are encouraged to partner with eligible institutions. In addition, NIFA remains committed to engaging small, mid-sized and minority-serving institutions and new investigators in all of its programs. To ensure their participation in AFRI we offer Food and Agriculture Science Enhancement (FASE) grants within all program areas. FASE gives special funding consideration to applications from qualifying schools for even the largest grants, and NIFA sets aside 10 percent of AFRI funding for this purpose. FASE-eligible schools are those with enrollments of fewer than 17,500 students, minority-serving institutions, and those in EPSCoR states (see Part II, D, 3, c, 2). In addition, AFRI gives special consideration to new faculty with fewer than five years of experience, and offers pre- and post-doctoral fellowships to encourage young scientists to engage in agricultural science.

More detailed comments relevant to each Challenge Area RFA will be published in those RFAs, along with NIFA's responses to those comments.

### **Background**

AFRI is one of NIFA's major programs through which to address critical societal issues such as those laid out in the *New Biology for the 21<sup>st</sup> Century: Ensuring the United States Leads the Coming Biology Revolution* report. USDA leadership has integrated the six AFRI priority areas (outlined in Part I, A) with a focus on grand societal challenges broadly identified by the scientific community in reports such as the "New Biology for the 21<sup>st</sup> Century". Leadership in the scientific community has been calling on multidisciplinary efforts, which integrate biological and social science work to help solve grand societal challenges. NIFA work brings the unique capacity to integrate research, education, and extension in order to enhance the impact of scientific work. USDA science will support the following challenges:

1. Keep American agriculture competitive while ending world hunger;
2. Improve nutrition and end child obesity;
3. Improve food safety for all Americans;
4. Secure America's energy future; and
5. Mitigate and adapt to climate variability and change.

In FY 2010, NIFA released several AFRI RFAs to address these challenges at a meaningful scale and to achieve outcomes of relevance to the societal challenges. These RFAs addressed each of the five challenges, enabled transition and refocusing of grants made previously under AFRI, and provided pre- and postdoctoral fellowship opportunities. These RFAs solicited applications for larger awards for longer periods of time to enable greater collaboration among institutions and organizations, and integration of basic and applied research with deliberate education and extension programs.

In FY 2013, AFRI will solicit projects addressing the above challenges through five separate Challenge Area RFAs, each addressing one of the challenges. AFRI will also support Research and Integrated Project grants in the six AFRI priority areas to continue building a foundation of knowledge in fundamental and applied food and agricultural sciences critical for solving current and future societal challenges. These six foundational Program Areas are being announced in a single, separate RFA. In addition, funding opportunities for pre- and postdoctoral fellowship grants will be offered in a single, separate RFA.

## Foundational Program

The Foundational Program RFA focuses on building a foundation of knowledge in fundamental and applied food and agricultural sciences critical for solving current and future societal challenges. Project types supported by AFRI within this area include single-function Research Projects, multi-function Integrated Projects, and Food and Agricultural Science Enhancement (FASE) Grants.

NIFA may also solicit applications for AFRI funds through other announcements, including supplemental AFRI RFAs or RFAs issued in conjunction with other agencies. Such announcements will be made public in the same manner as this announcement. Other sources of NIFA funding or work relevant to the AFRI Foundational Program Areas are as follows:

- *Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Species* (joint with National Institutes of Health (NIH)).  
Total Program Funds: Approximately \$5 million from AFRI. Information is available at <http://nifa.usda.gov/fo/researchinbiomedicineandagricultureafri.cfm>
- *National Robotics Initiative* (joint with National Science Foundation (NSF), NIH, National Aeronautics and Space Administration (NASA), and Department of Defense (DoD)).  
Total Program Funds: Approximately \$5 million from AFRI. Information is available at [http://nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503641](http://nsf.gov/funding/pgm_summ.jsp?pims_id=503641)
- *Plant Feedstock Genomics for Bioenergy* (joint with Department of Energy (DOE)).  
Total Program Funds: Approximately \$2 million from AFRI. Information is available at [www.nifa.usda.gov/fo/plantfeedstock.cfm](http://www.nifa.usda.gov/fo/plantfeedstock.cfm)
- *Ecology and Evolution of Infectious Diseases* (joint with NIH, NSF, and the U.K. Biotechnology and Biological Sciences Research Council (BBSRC)).  
Total Program Funds: Approximately \$2.5 million from AFRI. Information is available at <http://nifa.usda.gov/fo/ecologyandevolutionofinfectiousdiseases.cfm>
- *Water Sustainability and Climate* (joint with NSF)  
Total Program Funds: Approximately \$5 million from AFRI. Information is available at [www.nsf.gov/publications/pub\\_summ.jsp?WT.z\\_pims\\_id=503452&ods\\_key=nsf11551](http://www.nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=503452&ods_key=nsf11551)
- *Decadal and Regional Climate Prediction using Earth System Models (EaSM)* (joint with NSF)  
Total Program Funds: Approximately \$5 million from AFRI. Information is available at [www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=503399](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503399)

## C. Program Area Descriptions

### Background

NIFA offers a number of Program Areas that support Research, Education, Extension, and Integrated Projects. Applicants are encouraged to review this entire RFA, other AFRI RFAs, and explore other programs offered by NIFA to find the most appropriate source of funding. This RFA can be accessed through the Agency's Web site: [www.nifa.usda.gov/funding/afri/afri.html](http://www.nifa.usda.gov/funding/afri/afri.html).

The following Foundational Program Areas provide a base from which applications for Research Projects, Integrated Projects, and FASE Grants may be developed. These descriptions establish the scope of each Program Area. AFRI encourages submission of innovative "high-risk" projects with potential for future high impact on agriculture, as well as innovative proposals with potential for near-term results and impacts.

Projects addressing biological issues should focus on agriculturally-important organism(s) to accomplish the project objectives. The use of other organisms as experimental model systems must be justified relative to the goals of the appropriate program.

## 1. Plant Health and Production and Plant Products

### Background

Plant protection, plant production and the development of new plant products are critical to the sustainability and competitiveness of U.S. agriculture and the success and growth of the Nation's economy. Future improvements will require an increased understanding of complex, inter-related factors at a wide range of scales. These include investigations of plant biology at molecular, cellular and whole-plant levels as well as innovative and environmentally sound approaches to improve plants and protect them from biotic and abiotic stresses. Increased knowledge of plant systems and the various factors that affect plant productivity will allow U.S. agriculture to face critical challenges in areas such as food security, bio-energy, climate change, loss of agricultural land, and increasing global competition.

The AFRI Plant Health, and Production and Plant Products program area addresses the following priorities of the 2008 Farm Bill: A. Plant Health and Production and Plant Products – Plant systems (subpriorities i. plant genome structure and function; ii. molecular and cellular genetics and plant biotechnology; iii. conventional breeding, including cultivar and breed development, selection theory, applied quantitative genetics, breeding for improved food quality, breeding for improved local adaptation to biotic stress and abiotic stress; iv. plant pest interactions and biocontrol systems; v. crop plant response to environmental stresses; and vi. [improved] nutrient qualities of plant products); D. Renewable Energy, Natural Resources, and Environment - Natural resources and the environment (subpriorities i. fundamental structures and functions of ecosystems; ii. biological and physical bases of sustainable production systems; iv. global climate effects on agriculture; v. forestry; and vi. biological diversity); E. Agriculture Systems and Technology.- Engineering, products, and processes.(subpriority iii. new hazard and risk assessment and mitigation measures); and F. Agriculture Economics and Rural Communities – Markets, trade and policy (subpriority iv. choices and applications of technology).

The AFRI Plant Health and Production and Plant Products program area directly aligns with the Research, Education, and Economics Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) and specifically addresses: Goal 1 – Local and Global Food Supply and Security, Subgoals 1A, 1B, and 1C (which focus on Crop Production, Health, Genetics, Genomics, Genetic Resources, and Biotechnology); and Goal 2 - Responding to Climate and Energy Needs, Subgoals 2A and 2B (which focus on Climate Variability, Bioenergy/Biofuels and Biobased Products) by developing and extending approaches to enhance local and global food supply and security, while also responding to climate and energy needs.

In FY 2013, AFRI invites Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Plant Health and Production and Plant Products Program Area:

**Letter of Intent Deadline** – November 26, 2012 (5:00 p.m. ET); see Part IV, A for instructions

**Program Area e-mail for Submission of Letter of Intent** – [plants@nifa.usda.gov](mailto:plants@nifa.usda.gov)

**Application Deadline** – February 18, 2013 (5:00 p.m. ET)

**Total Program Funds** – Approximately \$37 million

#### **Proposed Budget Requests -**

- Standard Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 5 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed.

**Program Area Priorities** – Applicants must address at least one of the following:

#### 1. Plant Breeding for Agricultural Production

**Program Area Priority Code** – A1141

**Program Area Priority Contact** – Dr. Ed Kaleikau (202) 401-1931 or [ekaleikau@nifa.usda.gov](mailto:ekaleikau@nifa.usda.gov)

Research focus areas must include one or more of the following:

- Pre-breeding and germplasm enhancement, cultivar development, selection theory, applied quantitative genetics, participatory breeding, or development of novel approaches to phenotyping, especially focusing on public plant breeding programs; **or**
- Plant genome structure and function to connect genotype to phenotype to reduce the breeding cycle time especially focusing on advancing the field of phenomics; see [www.nifa.usda.gov/nea/plants/pdfs/whitepaper\\_finalUSDA.pdf](http://www.nifa.usda.gov/nea/plants/pdfs/whitepaper_finalUSDA.pdf).
- Develop content linked to the research focus areas described above and suitable for delivery through the existing eXtension Plant Breeding and Genomics Community of Practice ([www.extension.org/plant\\_breeding\\_genomics](http://www.extension.org/plant_breeding_genomics)) to amplify outreach and education efforts to plant breeders, seed industry professionals, and practitioners. A letter of acknowledgement from eXtension is required, and a letter of support may be required from the Community of Practice. For detailed guidance on how to “enhance an existing community of practice”, go to <http://create.extension.org/node/2057> and <http://pbgworks.org/node/1066>. Applicants must plan ahead and allow additional time to develop this partnership.

Other Program Area Priority Requirements:

- Provide a description and budgeted plan for the release of research results (e.g., data, germplasm, cultivars, genetic resources) that is compliant with the terms and conditions that govern **USDA NIFA funded projects in the areas of plant breeding, genetics and genomics**, especially p. 5 – (Genetic Resources from Outside of the U.S., and Patents and Inventions including Plant Variety Protection); and pp. 10-12 – (Release of Animal or Plant Genome Sequence Data and Distribution of Animal or Plant Genomic Resources, and the Release or Distribution of Plant Germplasm). Terms and conditions can be found at: [www.nsf.gov/pubs/policydocs/rct/agencyspecifics/nifa\\_512.pdf](http://www.nsf.gov/pubs/policydocs/rct/agencyspecifics/nifa_512.pdf)

## **2. Understanding Biological Mechanisms for Plant Production**

**Program Area Priority Code** – A1101

**Program Area Priority Contact** – Dr. Liang-Shiou Lin (202) 401-5045 or [lilin@nifa.usda.gov](mailto:lilin@nifa.usda.gov)

This priority area supports projects that will increase our understanding of biological processes of important agricultural plants that could enhance productivity, reduce yield losses caused by environmental stresses, and improve plant composition and nutritional quality.

Research focus areas must include one or more of the following:

- Molecular, biochemical, and cellular genetics of plant growth and development relevant to the enhancement of productivity or improvement of plant composition and nutritional quality; or
- Mechanisms of plant responses to abiotic environmental stresses.

Biotechnological approaches addressing these problems are also appropriate for this program area. Investigators interested in the mechanisms of plant responses to biotic stresses should consider submitting to the Understanding Plant-Associated Microorganisms and Plant-Microbe Interactions (A1121) or the Plant-Associated Insects and Nematodes (A1111) Program Area Priorities.

Although model organisms may be included as part of the proposed study, it is expected that a successful application will include agricultural plant species as a significant and integral component within the experimental design.

## **3. Understanding Plant-Associated Microorganisms and Plant-Microbe Interactions**

**Program Area Priority Code** – A1121

**Program Area Priority Contact** – Dr. Ann Lichens-Park (202) 401-6460 or [apark@nifa.usda.gov](mailto:apark@nifa.usda.gov)

This priority area supports projects on mechanisms of plant-microbe interactions, communication within microbial populations, communication between plants and microbes, and studies of epidemiological characteristics of agriculturally important microbes. Proposals may focus on fungi,

oomycetes, bacteria, viruses and/or the plants associated with them. However, systems studied must be strongly justified in terms of relevance to agriculture. The program encourages use of functional genomics approaches. Studies of model systems alone are not appropriate for this priority area.

Research focus areas must include one or more of the following:

- Elucidation of molecular mechanisms used by microorganisms to interact with plant hosts and/or with other microorganisms associated with plants. Applications may address pathogenic and/or beneficial interactions. Interactions addressed may be physical interactions, such as mechanisms used by microbial effector proteins to enter plant hosts and/or chemical interactions, such as chemical signaling;
- Elucidation of molecular mechanisms used by plants to respond to or interact with microorganisms; or
- Studies examining epidemiological factors that influence disease spread.

#### **4. Controlling Weedy and Invasive Plants**

**Program Area Priority Code – A1131**

**Program Area Priority Contact – Dr. Michael Bowers (202) 401-4510 or [mbowers@nifa.usda.gov](mailto:mbowers@nifa.usda.gov)**

This priority area supports projects that focus on compelling scientific questions underlying current issues in weed and invasive plant management in crops, managed forests and rangeland including:

- Ecological processes related to integrated pest management;
- The evolution, spread and mitigation of herbicide resistance based on an understanding of ecological fitness and gene flow; or
- Other ecological or evolutionary studies that would inform weed management strategies, including links between agronomic practices and weed problems.

#### **5. Plant-Associated Insects and Nematodes**

**Program Area Priority Code – A1111**

**Program Area Priority Contact – Dr. Mary Purcell-Miramontes (202) 401-5168 or [mpurcell@nifa.usda.gov](mailto:mpurcell@nifa.usda.gov)**

This priority area supports projects to increase fundamental and applied knowledge of biological and environmental processes that affect the abundance and spread of plant-associated pest and beneficial insects or nematodes in agricultural systems (including managed forests and rangeland). Research on factors associated with the decline of insect pollinators and development of solutions to mitigate these problems is particularly emphasized. While realizing the value of discovery-oriented research, this priority area will emphasize hypothesis-driven research. Projects that include an evaluation of pest or pollinator management are strongly encouraged to include an economic analysis.

Projects in this priority area may develop integrated pest management or other ecologically-based management programs (either in the short or long term). Projects on pests of livestock or nuisance pests in urban systems are not supported.

Research focus areas must include one or more of the following:

- Ecological, chemical, and genetic interactions between plants, insects or nematodes. Functional genomics approaches are encouraged;
- Mechanisms of plant response to insects or nematodes. Elucidation of signaling mechanisms between plants and insects or nematodes are encouraged;
- Transgenic and para-transgenic approaches to limit the severity of pests including vectors; or
- Structure and function of genomes of insects that vector plant diseases and associated obligate microbial symbionts. See [http://arthropodgenomes.org/wiki/Framework\\_for\\_Sequencing:\\_Insect\\_Symbioses](http://arthropodgenomes.org/wiki/Framework_for_Sequencing:_Insect_Symbioses). It is anticipated that one proposal will be funded for \$1 M over a 5-year period. Groups with existing

international collaboration and leveraging of funds with international funding agencies are encouraged.

**Other Program Area Priority Requirements:**

- Applications must provide a justification for the system studied relative to improving the economic, environmental and social sustainability of agriculture (see Part I, B).
- Projects that include an evaluation of plant management are encouraged to include an economic analysis.
- Provide a description and budgeted plan for the release of research results (e.g., data, germplasm, cultivars, genetic resources) that is compliant with the terms and conditions that govern **USDA NIFA funded projects in the areas of plant breeding, genetics and genomics**, especially p. 5 – (Genetic Resources from Outside of the U.S., and Patents and Inventions); and pp. 10-12 – (Release of Animal or Plant Genome Sequence Data and Distribution of Animal Genomic Resources). Terms and conditions can be found at: [www.nsf.gov/pubs/policydocs/rtc/agencyspecifics/nifa\\_512.pdf](http://www.nsf.gov/pubs/policydocs/rtc/agencyspecifics/nifa_512.pdf).

**Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.

## **2. Animal Health and Production and Animal Products**

### **Background**

Animal production and health play critical roles in the sustainability and competitiveness of U.S. agriculture. They contribute significantly to the nation's economy, global food production and food security. Our competitiveness depends on understanding the critical biological and physical mechanisms underlying nutrition, growth, reproduction, and health in livestock, poultry, equine, and aquacultured species. Research at the genomic, molecular, cellular and organ systems levels is essential. We need to expand our knowledge using basic and applied research to reduce production and health costs, enhance nutritional quality of animal products, and minimize environmental impacts. This information is required to develop better management strategies to improve production efficiency, enhance animal health, and develop improved animal products for humans. These strategies may include the application of biotechnology, conventional breeding, and breed development.

The AFRI Animal Health and Production and Animal Products program area addresses the following priorities within the 2008 Farm Bill: B. Animal Health and Production and Animal Products - Animal systems (subpriorities i. aquaculture; ii. cellular and molecular basis of animal reproduction, growth, disease, and health; iii. animal biotechnology; iv. conventional breeding, including breed development, selection theory, applied quantitative genetics, breeding for improved food quality, breeding for improved local adaptation to biotic stress and abiotic stress, and participatory breeding; v. identification of genes responsible for improved production traits and resistance to disease; vi. improved nutritional performance of animals; vii. improved nutrient qualities of animal products and uses; and viii. the development of new and improved animal husbandry and production systems that take into account production efficiency, animal well-being, and animal systems applicable to aquaculture).

The Animal Health and Production and Animal Products program area directly aligns with the Research, Education, and Economics Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) and specifically addresses: Goal 1. Local and Global Food Supply and Security; Goal 2. Responding to Climate and Energy Needs; and, Goal 3. Sustainable Use of Natural Resources.

In FY 2013, AFRI invites Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Animal Health and Production and Animal Products Program Area:



**Letter of Intent Deadline** – November 15, 2012 (5:00 p.m. ET); see Part IV, A for instructions

**Program Area e-mail for Submission of Letter of Intent** – [animals@nifa.usda.gov](mailto:animals@nifa.usda.gov)

**Application Deadline** – January 9, 2013 (5:00 p.m. ET)

**Total Program Funds** – Approximately \$33 million

**Proposed Budget Requests** –

- Standard Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 5 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed.

**Program Area Priorities** – Applicants must address at least one of the following:

**1. Animal Reproduction**

**Program Area Priority Code** – A1211

**Program Area Priority Contact** – Dr. Mark Mirando (202) 401-4336 or [mmirando@nifa.usda.gov](mailto:mmirando@nifa.usda.gov)

Cellular, molecular, genomic/genetic or whole-animal aspects of animal reproduction, especially focusing on:

- Gonadal function (including production, function, and preservation of gametes);
- Hypothalamic-pituitary axis; or
- Embryonic and fetal development (including interaction between the conceptus and its uterine environment).

**2. Animal Nutrition, Growth and Lactation**

**Program Area Priority Code** – A1231

**Program Area Priority Contact** – Dr. Mark Mirando (202) 401-4336 or [mmirando@nifa.usda.gov](mailto:mmirando@nifa.usda.gov)

Cellular, molecular, genomic/genetic or whole-animal aspects of nutrition, growth and lactation, especially focusing on:

- Nutrient utilization and efficiency;
- Common and alternative feedstuffs; or
- Improving the quality and efficiency of producing meat, milk and eggs.

**3. Animal Health and Disease**

**Program Area Priority Code** – A1221

**Program Area Priority Contacts** – Dr. Peter Johnson (202) 401-1896 or [pjohnson@nifa.usda.gov](mailto:pjohnson@nifa.usda.gov)  
and Dr. Margo Holland, (202) 401-5044 or [mholland@nifa.usda.gov](mailto:mholland@nifa.usda.gov)

Cellular, molecular, genomic/genetic or whole-animal aspects of animal health and disease, especially focusing on:

- Maintenance of homeostasis;
- Disease prevention (vaccines, diagnostics, enhanced innate or adaptive immunity, disease resistance or susceptibility, or management); or
- Therapeutic interventions for disease reduction/treatment.

**4. Tools and Resources for Animal Breeding, Genetics and Genomics**

**Program Area Priority Code** – A1201

**Program Area Priority Contact** – Dr. Lakshmi Kumar Matukumalli (202) 401-1766 or [lmatumalli@nifa.usda.gov](mailto:lmatumalli@nifa.usda.gov)

Development of community resources and tools, especially focusing on:

- Improvement of genome assembly and annotation;
- Discovery and analysis of genetic diversity within and across breeds or populations (e.g., detection of signatures of selection);
- Application of genome-wide methods for identification of gene regulatory regions;
- Novel quantitative genetics methods including selection theory and modeling;
- User-friendly web interfaces and data visualization tools having knowledge exchange capabilities between federated databases within and across species;
- Adoption and extension of cyber-infrastructure tools, such as iPlant and Kbase, to agricultural animals through customization and addition of new software tools, for genotype-phenotype associations from analysis of large-scale sequence and/or genotype data, databases, and user-friendly web-interface.

**NOTE:** The emphasis of this Program Area is on the development of tools and resources. Proposals that assess genome variation (e.g., selecting within a breed for a specific trait of interest) and relevance to function and phenotype for improved animal production or health, conventional animal breeding, breed development, or applied quantitative genetics should be directed to Program Area Priorities 1, 2 or 3 identified above.

#### **Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.
- Applicants must justify model systems (e.g., use of laboratory animals, cell cultures). Proposals that primarily use non-agricultural or non-aquacultured species as models will not be accepted.
- Applicants must include power analyses if experimental animals are used. Studies comparing treatment groups must justify the sample size for each experimental group, considering the magnitude of the treatment difference for the response variable, standard deviation for the response variable, power, and level of significance (i.e., probability of making a type I error).
- Applicants must provide a validation plan if diagnostic tests will be developed.
- Applicants must include a statement addressing Minimum Information about Microarray Experiment (MIAME) compliance (see [www.mged.org](http://www.mged.org)) if microarray studies are included.
- Applicants must provide a plan to release research results to the public in a timely manner.
- Applicants must provide a description and budgeted plan for the release of research results (e.g., sequence data, germplasm, genetic resources) that is compliant with the terms and conditions that govern USDA NIFA funded projects in the Animal Health and Production and Animal Products Program Area, where applicable, especially page 5 (Genetic Resources from Outside of the U.S., and Patents and Inventions including Plant Variety Protection) and; pages 10-12 (Release of Animal or Plant Genome Sequence Data and Distribution of Animal or Plant Genomic Resources, Release or Distribution of Animal Quantitative Trait Loci, and the Release or Distribution of Plant Germplasm). Terms and conditions can be found at [www.nsf.gov/pubs/policydocs/rtc/agencyspecifics/nifa\\_512.pdf](http://www.nsf.gov/pubs/policydocs/rtc/agencyspecifics/nifa_512.pdf).
- Applicants are encouraged to take advantage of molecular and biotechnology approaches to accelerate improvements in animal production and health, where appropriate.
- Proposals with primary focus on the following should not be submitted to Animal Health and Production and Animal Products:
  - Animal welfare. Consult the *Engineering, Products, and Processes* Program Area Priority (A1521) within this RFA.
  - Food Safety. Consult the *Food Safety, Nutrition, and Health* Program Area Priorities in this RFA for a possible fit.
  - Secondary effects or indirect effects of disease (e.g., on reproduction, muscle growth, lactation).
  - Plant-based vaccines.
- Applicants are encouraged to review the Ecology and Evolution of Infectious Diseases and the Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Species collaborative interagency programs. Additional information can be found under Part I, B.



### 3. Food Safety, Nutrition, and Health

#### Background

Human health is significantly affected by the safety, quality, and nutritive value of foods consumed. This program addresses: 1) microbial, physical, and chemical contamination of foods; 2) nutritional quality and links between food and health; 3) bioavailability of nutrients; 4) postharvest practices; and 5) improved food processing technologies.

In spite of recent advances in improving food safety, food-borne illness continues to be a source of concern for the American consumer, local, state and federal governments, and the food production industry. Recent outbreaks caused by *Salmonella*, *Listeria monocytogenes* (in United States), and Shiga toxin producing *E. coli* (in Europe) are examples of persistent food safety problems. Chemical (including allergens) and physical hazards that could be introduced at any point in the food chain also continue to pose food safety problems. In nutrition, knowledge of dietary reference intakes and tolerable upper limits, gut biology, nutrigenomics, and the bioavailability of proven bioactive components is integral to formulating nutritious and healthy diets. Undergirding the formulation of nutritious and healthy diets is the knowledge of chemical, biological and physical characteristics of food and food ingredients involved in food processing and packaging. Generating and applying the knowledge needed to improve the safety, quality, and nutritive value of foods are part of a comprehensive approach to preventing acute food-borne illnesses and chronic degenerative diseases such as coronary heart and other vascular diseases, cancer, Alzheimer's disease, diabetes, arthritis, and obesity. Food safety and food processing knowledge generated may also be helpful in addressing sustainability and food security.

Knowledge generated from this program will be useful in: enhancing the microbial, physical, and chemical safety of foods by preventing and mitigating contamination; formulating science based foods for health; providing evidence about the bioavailability of nutrients and bioactive components in foods, and improving processing, packaging and storage technologies to enhance the quality and shelf life of foods.

The AFRI Food Safety, Nutrition and Health program area addresses the following priorities within the 2008 Farm Bill: C. Food Safety, Nutrition, and Health - Nutrition, food safety and quality, and health (subpriorities i. microbial contaminants and pesticides residue relating to human health; ii. links between diet and health; iii. bioavailability of nutrients; iv. postharvest physiology and practices; and v. improved processing technologies).

The AFRI Food Safety, Nutrition, and Health program area directly aligns with the Research, Education, and Economics (REE) Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) specifically addresses: Goal 1. Local and Global Food Security Chain; Goal 4. Nutrition and Childhood Obesity; and Goal 5. Food Safety.

In FY 2013, AFRI invites Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Food Safety, Nutrition and Health Program Area:

**Letter of Intent Deadline** – November 19, 2012 (5:00 p.m. ET); see Part IV, A for instructions

**Program Area e-mail for Submission of Letter of Intent** – [foodnutrition@nifa.usda.gov](mailto:foodnutrition@nifa.usda.gov)

**Application Deadline** – February 6, 2013 (5:00 p.m. ET)

**Total Program Funds** – Approximately \$18 million

#### **Proposed Budget Requests-**

- Standard Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 5 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed.

**Program Area Priorities** – Applicants must address at least one of the following:

**1. Physical and Molecular Mechanisms of Food Contamination**

**Program Area Priority Code** – A1331

**Program Area Priority Contact** – Dr. Jeanette Thurston (202) 720-7166 or [jthurston@nifa.usda.gov](mailto:jthurston@nifa.usda.gov)

- Elucidate physical and/or molecular mechanisms that allow food-borne pathogens, chemicals, and/or engineered nanoparticles to attach onto and/or internalize into fresh and fresh-cut produce, including nuts; **or**
- Develop and validate novel concentration and purification methods for the rapid, low-cost, and efficient isolation of human pathogens from foods. Projects that include the development and validation of methods which are effective in multiple food matrices and for multiple pathogens are preferred.

**2. Function and Efficacy of Nutrients**

**Program Area Priority Code** – A1341

**Program Area Priority Contacts** – Dr. Ram Rao (202) 401-6010 or [rrao@nifa.usda.gov](mailto:rrao@nifa.usda.gov)  
and Dr. Deirdra Chester (202) 401-5178 or [dnchester@nifa.usda.gov](mailto:dnchester@nifa.usda.gov).

Improve function and efficacy of foods, nutrients and/or other dietary bioactive components in promoting health.

- Applications should focus on the role of bioactive components in food in preventing inflammation or promoting gastrointestinal health. Justification must be provided for the relationship of the component(s) being studied to human health outcomes. Priority will be given to projects that use a whole foods approach or that address health effects of a combination of two or more bioactive components found in food.

**3. Improving Food Quality**

**Program Area Priority Code** – A1361

**Program Area Priority Contacts** – Dr. Ram Rao (202) 401-6010 or [rrao@nifa.usda.gov](mailto:rrao@nifa.usda.gov) and  
Dr. Jodi Williams (202) 720-6145 or [jwilliams@nifa.usda.gov](mailto:jwilliams@nifa.usda.gov)

- Understanding the physical, chemical, and biological properties of foods and food ingredients and applying engineering principles, and advanced processing and packaging technologies to improve the nutrition, health, safety, shelf-life, convenience, economic and/or sensory attributes of foods.

**Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.
- The study of multiple fresh fruits, vegetables, or nuts is highly encouraged.
- Support will not be provided for research on the development of dietary supplements, research on dietary therapies for existing disease, or for the establishment, expansion, or maintenance of dietary databases.
- Surveys of the nutritional status of population groups are not acceptable for this program.
- While upper limits are placed on grant requests and grant durations, this program area also strongly encourages proposals from investigators, who are in transition to new areas of investigation, particularly high risk/high return proposals that may require lower funding levels or shorter grant periods
- Exploration of science at the interface of food science and nutrition is highly encouraged for Program Area Priorities 2 and 3.
  - In program area priority 3, applications in post harvest area will be accepted; primary emphasis should be on quality.
  - All food safety applications must address Program Area Priority 1.

## 4. Renewable Energy, Natural Resources, and Environment (RENRE)

### Background

Healthy agroecosystems and the maintenance of supporting natural resources are essential to the sustained long-term productivity of agricultural goods and services. However, degradation or loss of ecosystem services through natural processes or anthropogenic interventions (e.g., flooding, increasing water shortages, greater air and water pollution, soil quality and productivity degradation, reduced biological diversity, land use changes, greater frequency of extreme weather events), threatens the sustainability of U.S. agriculture. The goal of this Program Area is to fund a portfolio of research projects that improve our understanding of the linkages among processes and management actions at diverse spatial and temporal scales that will sustain agroecosystems and the supporting natural resources of those systems.

Agroecosystems can include crop production systems, animal production systems (either intensive or extensive), and pasture, range, and forest lands that are actively managed to provide economic, societal, and environmental benefits for individuals, communities, and society at large. Sustainable management of agroecosystems requires improved understanding of interactions among physical, chemical, and biological processes and their response to changing conditions. It also requires scientific knowledge that integrates the complex interactions between management practices and natural processes in order to anticipate and avoid critical thresholds of irreversible damage or loss. Projects funded through this Program Area should contribute towards improved efforts to achieve sustainable production in agroecosystems while retaining needed ecosystems services. This Program Area anticipates funding projects that reflect diverse spatial and temporal scales across a geographic diversity of agroecosystems.

The AFRI Renewable Energy, Natural Resources and Environmental (RENRE) program area addresses the following priorities within the 2008 Farm Bill: D. Renewable Energy, Natural Resources, and Environment - Natural resources and the environment (subpriorities i. fundamental structures and functions of ecosystems; ii. biological and physical bases of sustainable production systems; iii. minimizing soil and water losses and sustaining surface water and ground water quality; iv. global climate effects on agriculture; and v. forestry).

The RENRE program area directly aligns with the Research, Education, and Economics Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) and specifically addresses Goal 3. Sustainable Use of Natural Resources, Subgoals 3A and 3B by developing knowledge to improve the efficiency of water use (particularly for irrigation) and developing and extending science and technology to achieve the maximum crop per drop of water that meets food safety requirements for agricultural goods and services; and funding research that will develop an integrated/multidisciplinary program that takes a full-accounting approach to conservation, improved efficiency, control technologies, environmental credit trading, and process-based models for reactive nitrogen.

In FY 2013, AFRI invites Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Renewable Energy, Natural Resources and Environment Program Area:

**Letter of Intent Deadline** – November 15, 2012 (5:00 p.m. ET); see Part IV, A for instructions

**Program Area e-mail for Submission of Letter of Intent** – [naturalres@nifa.usda.gov](mailto:naturalres@nifa.usda.gov)

**Application Deadline** – February 21, 2013 (5:00 p.m. ET)

**Total Program Funds** – Approximately \$17 million

### Proposed Budget Requests

- Standard Research Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 4 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed.

**Program Area Priority** – Applicants must address the following:

**1. Soil, Air, and Water Processes in Agroecosystems**

**Program Area Priority Code – A1401**

**Program Area Priority Contacts** – Dr. James P. Dobrowolski (202) 401-5016 or [jdobrowolski@nifa.usda.gov](mailto:jdobrowolski@nifa.usda.gov) and Dr. Nancy Cavallaro (202) 401-5176 or [ncavallaro@nifa.usda.gov](mailto:ncavallaro@nifa.usda.gov)

This priority seeks to improve the understanding of fundamental soil, air, and water processes in actively managed agroecosystems, rangelands, and/or forests especially in areas potentially impacted by more frequent and severe droughts and/or floods. Applicants are encouraged to evaluate the physical, biogeochemical (including microbial), and/or coupled (e.g., nitrogen coupled with soil carbon) processes affecting the flow, fate and transport, transformation, movement, and storage of either:

- Nitrogen and phosphorus, implicated as both downstream and/or atmospheric pollutants; or
- Chemicals of Emerging Concern (CEC) in recycled, drainage, and runoff water with the potential to be used for irrigation. Relevant CECs are from animal and human waste pathways that are of environmental, human health, and/or food safety concern (e.g., human drugs, veterinary drugs, antibiotics, hormones).

Applications may address processes altered by the involvement of microbial communities, especially across soil-air-water interfaces. Applicants should include one of the following:

- Predictive and/or hindcasting tools to assess control technologies to mitigate nitrogen, phosphorus, and/or CEC movement; or
- Improve process-based models to analyze nitrogen, phosphorus, and/or CEC life cycles in agroecosystems, rangelands, and forests.

Applicants must explain how a better understanding of the fundamental processes will help sustain ecosystem services.

**Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.
- Applicants seeking to study CECs from either animal or human waste pathways are advised that transport by irrigation water and/or runoff are the mechanisms of interest; projects evaluating the effects of land application of biosolids (sludge) are directed to funding from Environmental Protection Agency's (EPA's) National Water Program research.
- Applications must include a section justifying the system studied in relation to improving economic, social, and environmental sustainability of agriculture; see Part I. B.
- All systems under study must be strongly justified in terms of agricultural importance.
- Projects may be single discipline or interdisciplinary. Single disciplinary projects must clearly explain relevance within the context of the larger agroecosystem.
- Applicants are encouraged to review the Water Sustainability and Climate and Decadal and Regional Climate Prediction using Earth System Models (EaSM) collaborative Interagency Program. Additional information can be found under Part I, B.

**5. Agriculture Systems and Technology**

**Background**

This Program Area emphasizes the interrelationships between agricultural system components to develop the next generation of engineered systems, products, processes, and technologies. It blends biological, physical, and social sciences. This approach will lead to sustainable, competitive, and innovative solutions for U.S. and global agriculture and food production. Some key disciplinary

contributors may include: engineering; agricultural economics; chemistry; microbiology; soil science; animal and plant sciences; veterinary medicine; genetics; social sciences; behavioral sciences; food safety; physics; materials science; and toxicology. To the extent possible, applicants are encouraged to incorporate interdisciplinary sciences. By doing so, projects are more likely to incorporate varying dimensions of sustainability (economic, environmental, and social) and have a greater impact on agricultural problems. The broad list of topics encompassed by this area includes, but is not limited to:

1. New uses and products from traditional and nontraditional crops, animals, byproducts, and natural resources;
2. Robotics, automation, precision and geospatial technologies, energy efficiency, computing, and expert systems;
3. New hazard and risk assessment and mitigation measures; and
4. Water quality and management and irrigation.

The Agriculture Systems and Technology program area addresses the following priorities within the 2008 Farm Bill: E. Agriculture Systems and Technology - Engineering products and processes (subpriorities i. new uses and new products from traditional and nontraditional crops, animals, byproducts, and natural resources; ii. robotics, energy, efficiency, computing, and expert systems; iii. new hazard and risk assessment and mitigation measures; and iv. water quality and management).

The Agriculture Systems and Technology program area directly aligns with the Research, Education, and Economics Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) and specifically addresses: Goal 1. Local and Global Food Supply and Security and Goal 3. Sustainable Use of Natural Resources.

In FY 2013, AFRI invites Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Agriculture Systems and Technology Program Area:

**Letter of Intent Deadline-** November 20, 2012 (5:00 p.m. ET); see Part IV, A for instructions  
**Program Area e-mails for Submission of Letter of Intent:** [epp@nifa.usda.gov](mailto:epp@nifa.usda.gov) for Engineering, Products, and Processes; [nano@nifa.usda.gov](mailto:nano@nifa.usda.gov) for Nanotechnology for Food and Agriculture  
**Application Deadline:** February 13, 2013 (5:00 p.m. ET)

**Total Program Funds:** Approximately \$12 million

**Proposed Budget Requests –**

- Standard Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 5 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed.

**Program Area Priorities –** Applicants must address at least one of the following:

**1. Engineering, Products, and Processes**

**Program Area Priority Code –** A1521

**Program Area Priority Contacts –** Dr. Daniel Schmoldt (202) 720-4807 or

[dschmoldt@nifa.usda.gov](mailto:dschmoldt@nifa.usda.gov) and

Dr. Richard Hegg (202) 401-6550 or [rhegg@nifa.usda.gov](mailto:rhegg@nifa.usda.gov)

This Program Area Priority focuses on engineering, products, and processes to improve agriculturally relevant plant, animal, forestry, and natural resource systems. Applications must have a significant engineering component. Engineering is defined as *the application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, technologies, machines, processes, and systems.* Some broad research emphasis areas include (but are not limited to):

- Enable engineering, computing, and information systems for forestry and natural resources or

- for plant and animal production, processing, and distribution;
- Contribute to improved animal welfare and production systems as they relate to handling, containment, feeding, housing, and harvesting practices and technologies;
- Improve the efficiency of energy and water use;
- Minimize and/or utilize waste and byproducts generated in agricultural and food systems;
- Develop and test risk assessment and mitigation measures to reduce hazards to agricultural workers; and
- Refine the sustainability of agricultural and forestry systems that balance economic, environmental, and social outcomes.

Special notes:

- Applicants interested in water-related topics should also consider the National Integrated Water Quality Program ([www.nifa.usda.gov/fo/waterquality.cfm](http://www.nifa.usda.gov/fo/waterquality.cfm)). Applications developing or piloting water management technologies on handheld devices must submit to that program.
- Except for nanotechnology (see below), applications dealing with food engineering, food processing, or food technology should be submitted to the Food Safety, Nutrition, and Health program area in this solicitation.

## **2. Nanotechnology for Agricultural and Food Systems**

**Program Area Priority Code** – A1511

**Program Area Priority Contacts** – Dr. Hongda Chen (202) 401-6497 or [hchen@nifa.usda.gov](mailto:hchen@nifa.usda.gov) and Dr. Daniel Schmoldt (202) 720-4807 or [dschmoldt@nifa.usda.gov](mailto:dschmoldt@nifa.usda.gov)

Nanoscale science, engineering, and technology embrace opportunities in a broad range of critical challenges facing agriculture and food systems. This Priority Area encourages applications in the following broad areas: innovative ideas and fundamental sciences to develop nanotechnology enabled solutions for food security through improved productivity, quality, and biodiversity; improved nutritional value of feeds that significantly impact animal health and wellness; enhanced food safety and biosecurity; and increased protection for natural resources, the environment, and agricultural ecosystems. The Program Area Priority scope includes, but is not limited to:

- Novel uses and high value-added products of nano-biomaterials of agricultural and forest origins for food and non-food applications;
- Nanoscale-based sensing mechanisms and smart sensors for reliable and cost-effective early detection of insects, diseases, pathogens, chemicals, and contaminants;
- Monitoring physiological biomarkers for optimal crop or animal productivity;
- Minimally invasive field survey tools for agricultural production;
- Precision agriculture technologies including applications of agricultural chemicals and water resources;
- Assessment and analysis of the perceptions and social acceptance of nanotechnology and nano-based food or non-food products by the public and agriculture and food stakeholders, using appropriate social science tools; and
- Discovery and characterization of nanoscale phenomena, processes, and structures relevant to agriculture and food.

To ensure responsible development and deployment of nanotechnology and reap the benefits, applications should consider incorporating proper risk assessment studies as appropriate. These may include characterization of hazards and exposure levels, transport and fate of nanoparticles or nanomaterials in crops, soils (and soil biota), and livestock. This may also include animal feed formulations and processes that utilize novel materials or develop new nanostructured materials or nanoparticles that are bio-persistent in digestive pathways. Finally, all the applications, especially those with commercial impact in sight, are encouraged to include economic analyses of anticipated benefits to agriculture, food, and society.



Nanotechnology is defined by the National Nanotechnology Initiative (NNI) as "...the understanding and control of matter at dimensions between approximately 1 and 100 nanometers, where unique phenomena enable applications. Encompassing nanoscale science, engineering and technology, nanotechnology involves imaging, measuring, modeling and manipulating matter at this length scale" (<http://nano.gov/>). This program area priority encourages new platforms of nanotechnology in the area of higher order assembled systems, and more complex systems that include the exploitation of bio-nano interfaces, hybrid bio-inorganic systems, systems biology, and synthetic biology.

Special note:

- Applications specifically dealing with engineered nanoparticles to attach onto and/or internalize into fresh and fresh-cut produce, including nuts, should be submitted to the Physical and Molecular Mechanisms of Food Contamination priority (A1331) of the Food Safety, Nutrition, and Health program area in this solicitation.

**Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.
- Applicant must describe the potential of the proposed work to support or achieve substantial gains in efficiencies of production; the probability that the application of technology will resolve constraints or result in positive impacts; and potential outcomes in terms of expected social and environmental benefits of research (see Part I, B).
- Where applicable, indicate plans to show adequate statistical rigor, including sample size justification.
- Provide a plan to disseminate or publicize results to the public in a timely manner.
- Applicants are also encouraged to consider the National Robotics Initiative collaborative interagency program. Additional information can be found under Part I, B.

**6. Agriculture Economics and Rural Communities (AE&RC)**

**Background**

Rural community issues center around economic opportunity and development, entrepreneurship, health and well-being. The 2007 Census of Agriculture indicates small and mid-sized farms, with less than \$500,000 in annual sales, dominate rural landscapes and account for over 95 percent of all farming operations and significantly contribute to rural family life and household incomes as well as local, state, and regional economies. But challenges exist for rural communities; between 2000 and 2009, nonmetro median incomes fell 2 percent and poverty rates rose from 13.4 to 16.6 percent.

The agricultural and forestry sectors also increasingly face major challenges in providing agricultural products of food, feed, fiber and fuel for a growing worldwide population. To overcome the challenges of rural quality of life and agricultural production, while maintaining a long-term sustainable agricultural system, continued research and development of innovative ideas, strategies and new technologies are needed. The challenges are multi-faceted and complex. To adequately assess and understand them we need to consider social, behavioral, economic, physical, environmental, institutional, or other factors contributing to or arising from these challenges. Given these opportunities and challenges, the primary goal of this priority area is to promote economically, socially, and environmentally sustainable agriculture and resilient rural communities. The objectives of this program area are to:

- Satisfy human food, feed, and fiber needs;
- Enhance environmental quality and the natural resource base;
- Sustain the economic viability of agriculture and rural communities; and
- Enhance the quality of life of farmers, farm workers, and the rural communities.

This AE&RC program area thus supports projects that sustain and enhance agricultural and related activities in rural areas and to protect the environment, enhance quality of life, and alleviate poverty. Topical issues include, but are not limited to, the interactions between agriculture, environment and communities in rural areas, demographic changes and impacts, consumer preferences or behavior,

decision-making under uncertainty; market structure and performance; policy design and impact; or agriculture's impact on the environment. The AE&RC program area primarily supports social and behavioral science disciplines such as economics, sociology, political science and others. Interdisciplinary efforts involving social and nonsocial science disciplines are also invited. Domestic and international partnerships that leverage resources and are mutually beneficial to the applicant, other U.S. states, or other countries are encouraged.

The AE&RC program area invites integrated projects, (project components must include at least two of the following: research, teaching or extension), which address issues related (1) Small and Mid-sized Farms, (2) Entrepreneurship, Technology and Innovation Policy, or (3) Rural Families, Communities and Regional Development issues. The AE&RC program area also invites research projects that broadly address aspects of (1) Economics, Markets & Trade and (2) Environment. Further program area descriptions are presented below.

The Agriculture Economics and Rural Communities program area addresses the following priorities within the 2008 Farm Bill: D. Renewable Energy, Natural Resources, and Environment – Natural resources and environment (subpriorities ii. biological and physical bases of sustainable production system; and v. forestry); and F. Agriculture Economics and Rural Communities – Markets, trade and policy (subpriorities i. strategies for entering into and being competitive in domestic and overseas markets; ii. farm efficiency and profitability, including the viability and competitiveness of small and medium-sized dairy, livestock, crop and other commodity operations; iii. new decision tools for farm and market systems; iv. choices and application of technology; v. technology assessment; and vi. new approaches to rural development, including rural entrepreneurship).

The AFRI Agricultural Economics and Rural Communities program area directly aligns with the Research, Education, and Economics Action Plan ([www.ree.usda.gov/ree/news/USDA\\_REE\\_Action\\_Plan\\_02-2012\\_2.pdf](http://www.ree.usda.gov/ree/news/USDA_REE_Action_Plan_02-2012_2.pdf)) and specifically addresses: Goal 1. Local and Global Food Supply and Security by developing and transferring knowledge and skills that promote sustainable agricultural systems locally, regionally, and globally for all types of agriculture production systems, thereby enhancing domestic and international food security and strengthening American agriculture; and Goal 7. Rural-Urban Interdependence and Prosperity by providing effective research, education, and extension that inform public and private decision making in support of rural and community development.

In FY 2013, AFRI invites Integrated and Research Project applications that support Standard, Conference, and FASE Grant types relevant to the priorities of the Agriculture Economics and Rural Communities Program Area:

**Letter of Intent Deadline** – Letter of Intent NOT required for this Program Area

**Application Deadline** – May 22, 2013 (5:00 p.m. ET)

**Total Program Funds** – Approximately \$19 million

**Proposed Budget Requests** –

- Standard Grants must not exceed \$500,000 total (including indirect costs) for project periods of up to 5 years.
- Conference and Food and Agricultural Science Enhancement (FASE) Grants must adhere to the guidelines outlined beginning in Part II, D. 3.
- Requests exceeding the budgetary guidelines will not be reviewed

**Program Area Priorities for Integrated Projects** – Applicants must address one of the following: (NOTE: Refer to Part II, C and Part III, A for Integrated Project Type definitions and eligibility information).



### 1. **Small and Medium-Sized Farms**

**Program Area Priority Code** – A1601

**Program Area Priority Contact** – Dr. Suresh Sureshwaran (202) 720-7536 or [ssureshwaran@nifa.usda.gov](mailto:ssureshwaran@nifa.usda.gov); and  
Dr. Denis Ebodaghe (202) 401-3385 or [debodaghe@nifa.usda.gov](mailto:debodaghe@nifa.usda.gov)

Develop and/or adopt new multidisciplinary (economic, social, behavioral, institutional, physical, biological, environmental, etc.) theories and models to assist farmer/forest landowner decision making with respect to appropriate scale farm management strategies and technologies to enhance efficiency and sustainability, including the viability and competitiveness of small and medium sized dairy, poultry, livestock, crop, agroforestry, forestry, and other commodity operations. Evaluate and implement strategies to enhance access to markets by small and mid-sized farms. Research and aid in the development of local and regional food systems. Assess the impacts of changes in input costs and markets, including farm labor (and immigration policies), credit and insurance markets (including healthcare), on farm entry, farm transition, and farm viability and in turn, implement programs to assist beginning, small and medium-sized farms. Examine private/public options or alternative strategies and provide or transfer information that can inform relevant public policy.

### 2. **Entrepreneurship, Technology and Innovation**

**Program Area Priority Code** – A1621

**Program Area Priority Contact** – Dr. Suresh Sureshwaran (202) 720-7536 or [ssureshwaran@nifa.usda.gov](mailto:ssureshwaran@nifa.usda.gov); and  
Dr. Robbin Shoemaker (202) 720-5468 or [rshoemaker@nifa.usda.gov](mailto:rshoemaker@nifa.usda.gov)

Through research, education, or extension activities, projects will enhance the development of rural entrepreneurship; enhance the technology transfer from colleges, universities and other research laboratories to rural manufacturers; develop new and creative economic or social opportunities for rural community vitality, including technology adoption and innovative business opportunities and strategies (e.g., to promote agro-tourism, arts, and e-commerce); and identify or evaluate the implications and impact of small business development strategies to promote sustainability of small and medium-sized farms and rural communities.

### 3. **Rural Families, Communities and Regional Development**

**Program Area Priority Code** – A1631

**Program Area Priority Contact** – Dr. Suresh Sureshwaran (202) 720-7536 or [ssureshwaran@nifa.usda.gov](mailto:ssureshwaran@nifa.usda.gov); and  
Dr. Robbin Shoemaker (202) 720-5468 or [rshoemaker@nifa.usda.gov](mailto:rshoemaker@nifa.usda.gov)

Evaluate the institutional, sociological, or economic factors affecting decision making and application of technology and in turn, promote the adoption of private strategies and public policy options to enhance investments in agriculture and rural communities. Enhance the adoption of optimal regional land use and architectural decisions, including regional clusters, that protect the rural environment and promote economic development, health and well-being while alleviating poverty and enhancing rural quality of life. Develop research and education strategies to advance the adoption and use of broadband and other digital technologies. Examine factors contributing to a “wealth-based” approach to rural economic development and how wealth creation can enhance rural development. Implement education and/or outreach strategies to enhance wealth creation. Develop and model networks (network analysis) of regional assets or factors, (e.g., firms, organizations, and communities and infrastructure), and the links between them that aid creation and nurture rural economic development. Examine comprehensive strategies and promote the development of a relevant mix of factors (e.g., colleges, airports, amenities, telecommunications, etc.) that contribute to effective growth strategies.

**Program Area Priorities for Research Projects** – Applicants must address one of the following:  
(NOTE: Refer to Part II, C and Part III, A for Research Project Type definitions and eligibility information).

**1. Economics, Markets and Trade**

**Program Area Priority Code** – A1641

**Program Area Priority Contact** – Dr. Robbin Shoemaker (202) 720-5468 or  
[rshoemaker@nifa.usda.gov](mailto:rshoemaker@nifa.usda.gov)

Research areas include: agricultural market structure and performance in the supply chain; international trade; production and resource use; consumer behavior and behavioral economics; farm labor market, immigration and policy; policy design; technology development; and science and innovation policy. Areas to consider include: examine the economic impacts of local markets on food supply, demand and quality; the role of behavioral economics or mechanism design in nutrition and food safety and other public policy issues. Continued advances in agricultural productivity growth are needed to increase the growth of output to sustain global agricultural production for decades to come. Examine social, behavioral and economic sources and barriers to future productivity growth, including incentives for collaboration between the public and private sectors for advancing food, agricultural and environmental sciences. Develop novel approaches to measuring scientific effort, impacts and outcomes for effective quantitative and qualitative research evaluation in any of these research areas.

**2. Environment**

**Program Area Priority Code** – A1651

**Program Area Priority Contact** – Dr. Robbin Shoemaker (202) 720 – 5468 or  
[rshoemaker@nifa.usda.gov](mailto:rshoemaker@nifa.usda.gov)

The goal of this priority is to increase the efficiency of economic and social welfare for long-term sustainability of agricultural systems. Research projects funded through this priority will enhance understanding of causes, tradeoffs, implications, or impacts of market failure on agricultural systems and rural communities. Develop innovative strategies to incorporate externalities in allocating agricultural or forest resources and product markets at different scales or temporal variations for issues such as spatial heterogeneity, human health and well-being, social equality, or economic development.

**Other Program Area Key Information:**

- All applications must adhere to the requirements beginning in Part IV.
- Applications from, and collaborations with, small to mid-sized institutions, minority-serving institutions, and/or EPSCoR states are strongly encouraged.
- Applications must include a section providing a justification for the system studied relevant to improving economic, social, and environmental sustainability of agriculture.
- This program area will not fund the research and development of technologies and tools.

## **PART II – Award Information**

### **A. Available Funding**

There is no commitment by USDA to fund any particular application or to make a specific number of awards. In FY 2013, subject to availability of funds, approximately \$264 million will be available to support the AFRI Program. Of this amount, no less than 30 percent will be made available to fund integrated research, education, and extension programs. Of the AFRI funds allocated to research activities, section 7406 of the FCEA directs 60 percent of the grants for fundamental (or basic) research and 40 percent of the grants for applied research. Of the AFRI funds allocated to fundamental research, not less than 30 percent will be directed toward research by multidisciplinary teams. It is anticipated that no less than 10 percent of the FY 2013 funds will be made available for Food and Agricultural Science Enhancement (FASE) Grants, and no more than two percent of the funds available for fundamental research will be made available for Equipment Grants. AFRI funds may be used to support applications submitted to supplemental AFRI RFAs and/or solicitations for multi-agency programs in which AFRI is and will be participating.

NOTE: This RFA is being released prior to the passage of an Appropriations Act for FY 2013. Enactment of an Appropriations Act may affect the overall level of funding for the AFRI program. Therefore, NIFA reserves the right to amend, delete, or alter any programs outlined in this RFA.

In FY 2013, subject to availability of funds it is anticipated that approximately \$ 136 million will be made available to support new awards within the AFRI Foundational Program.

Awards issued as a result of this RFA will have designated the Automated Standard Applications for Payment System (ASAP), operated by the Department of Treasury's Financial Management Service, as the payment system for funds. For more information see [www.nifa.usda.gov/business/method\\_of\\_payment.html](http://www.nifa.usda.gov/business/method_of_payment.html).

### **B. Types of Applications**

#### **1. New Application**

A new application is an application that has not been previously submitted to AFRI. All new applications will be reviewed competitively using the evaluation criteria described in Part V – Application Review Requirements.

#### **2. Resubmitted Application**

A resubmitted application is an application that has previously been submitted to AFRI, but was not funded. Project Directors (PD) must respond to the previous panel review summary; see Response to Previous Review, Part IV, C. 4. c. Resubmitted applications must be received by the relevant due dates, will be evaluated in competition with other pending applications in the appropriate area to which they are assigned, and will be reviewed according to the same evaluation criteria (Part V, B.) as New Applications. Applications which appear to be resubmissions (regardless of the designation) are regarded as such by the program and the panel and compete on the same basis with all other applications submitted to the Program Area Priority at the same time.

Applicants submitting to Program Areas from the FY 2011 AFRI Foundational Program RFA may resubmit applications to the appropriate Program Area Priorities, if offered in FY 2013, within this RFA.

All awards will be made as standard awards. A standard award is an award instrument by which the Department agrees to support a specified level of effort for a predetermined project period without the announced intention of providing additional support at a future date. Conference, Sabbatical, Equipment, and Seed Grants will also be made as standard awards.

## C. Project Types

Applications must propose one of the project types specified with the Program Area(s) and select the appropriate grant type for the application within the constraints of the grant types solicited. The project and grant types solicited in the AFRI Foundational Program Area are indicated in the table below and described in the Program Area Descriptions beginning in Part I, C.

Project and Grant Types Solicited by foundational Program Area											
		Grant Type									
		Standard	CAP	Planning/ Coordination	Conference	Food and Agricultural Science Enhancement (FASE) Grants <sup>1</sup>					
						New Investigator	Strengthening Grants				
							Sabbatical	Equipment	Seed	Standard	CAP
Project Type	Research	✓			✓	✓	✓	✓	✓	✓	
	Education										
	Extension										
	Integrated <sup>2</sup>	✓			✓	✓	✓	✓	✓	✓	

<sup>1</sup> FASE Grants have special eligibility requirements. Refer to Part II, D. 3 for eligibility and additional information.

<sup>2</sup> Note that **ONLY the Agriculture Economics and Rural Communities Program Area (see Part I, C. 6) is soliciting Integrated Projects in this RFA.**

The work proposed for all project types must address a specific Program Area Priority described under Program Area Descriptions beginning in Part I, C., and the application must be submitted directly to that Program Area by the designated deadline date. Additionally, applicants must adhere to the Application and Submission Information beginning in Part IV when preparing applications.

### 1. Research Projects

Single-function Research Projects support fundamental or applied research conducted by individual investigators, co-investigators within the same discipline, or multidisciplinary teams.

**Fundamental research** means research that (i) increases knowledge or understanding of the fundamental aspects of phenomena and has the potential for broad application and (ii) has an effect on agriculture, food, nutrition, or the environment.

**Applied research** means research that includes expansion of the findings of fundamental research to uncover practical ways in which new knowledge can be advanced to benefit individuals and society.

**Multidisciplinary projects** are those in which investigators from two or more disciplines collaborate closely to address a common problem. These collaborations, where appropriate, may integrate the biological, physical, chemical, or social sciences.

### 2. Integrated Research, Education, and/or Extension Projects

NOTE that Agriculture, Economics and Rural Communities Program area (Part I, C. 6) is soliciting integrated projects through this RFA.

An Integrated Project includes at least two of the three functions of the agricultural knowledge system (i.e., research, education, and extension) within a project, focused around a problem or issue. The functions addressed in the project should be interwoven throughout the life of the project and act to complement and reinforce one another. The functions should be interdependent and necessary for the success of the project and no more than two-thirds of the project's budget may be focused on a single component.

- a) The proposed **research** component of an integrated project should address knowledge gaps that are critical to the development of practices and programs to address the stated problem.
- b) The proposed **education** (teaching and teaching-related) component of an Integrated Project should develop human capital relevant to overall program goals for U.S. agriculture. An education or teaching activity is formal classroom instruction, laboratory instruction, and practicum experience in the food and agricultural sciences and other related matters such as faculty development, student recruitment and services, curriculum development, instructional materials and equipment, and innovative teaching methodologies.

Educational activities may include any of the following: conducting classroom and laboratory instruction and practicum experience; faculty research internships for curricula development; cutting-edge agricultural science and technology curriculum development; innovative teaching methodologies; instructional materials development; education delivery systems; student experiential learning (student led-research; internships; externships; clinics); student learning styles and student-centered instruction; student recruitment and retention efforts; career planning materials and counseling; pedagogy; faculty development programs; development of modules for on-the-job training; providing knowledge and skills for professionals creating policy or transferring to the agriculture workforce; faculty and student exchanges; and student study abroad and international research opportunities relevant to overall program goals for U.S. agriculture. Educational activities must show direct alignment with increasing technical competency in AFRI priority area(s) to ensure that U.S. agriculture remains globally competitive in the knowledge age.

Educational components must address one or two of the following key strategic actions:

- Train students for Associate, Baccalaureate, Master's or Doctoral degrees; and/or
- Prepare K-12 teachers and higher education faculty to understand and present food and agricultural sciences.

These projects should synthesize and incorporate a wide range of the latest relevant research results. Note that routine use of graduate students and postdoctoral personnel to conduct research is not considered education for the purposes of this program.

- c) The proposed **extension** component of an Integrated Project should conduct programs and activities that deliver science-based knowledge and informal educational programs to people, enabling them to make practical decisions. Program delivery may range from community-based to national audiences and use communication methods from face-to-face to electronic or combinations thereof. Extension Projects may also include related matters such as certification programs, in-service training, client recruitment and services, curriculum development, instructional materials and equipment, and innovative instructional methodologies appropriate to informal educational programs.

Extension activities may address, but are not limited to, the following key strategic actions:

- Support informal education to increase food, agricultural, and health literacy of youth and adults;
- Promote science-based agricultural literacy by increasing understanding and use of food and agricultural science data, information, and programs;
- Build science-based capability in people to engage audiences and enable informed decision making;
- Develop new applications of instructional tools and curriculum structures that increase technical competency and ensure global competitiveness;
- Offer non-formal learning programs that increase accessibility to new audiences at the rate at which new ideas and technologies are tested and/or developed at the community-scale; and

- Develop programs that increase public knowledge and citizen engagement leading to actions that protect or enhance the nation's food supply, agricultural productivity, environmental quality, community vitality, food security and/or public health and well-being.

These projects should synthesize and incorporate a wide range of the latest relevant research results. Please note that research-related activities such as publication of papers or speaking at scientific meetings are not considered extension for the purposes of this program.

Integrated Projects aim to resolve today's problems through the application of science-based knowledge and address needs identified by stakeholders. Integrated Projects clearly identify anticipated outcomes and have a plan for evaluating and documenting the success of the project. These projects should lead to measurable, documented changes in learning, actions, or conditions in an identified audience or stakeholder group.

Integrated Project applicants are encouraged to review [www.nifa.usda.gov/funding/integrated/integrated.html](http://www.nifa.usda.gov/funding/integrated/integrated.html) for additional information on integrated programs, including tips for writing Integrated Project applications and an example of an integrated application. Those interested in submitting Integrated Project applications are encouraged to contact the appropriate Program Area Priority Contact to discuss the anticipated project parameters and outcomes to ensure the application content appropriately meets the requirements of an Integrated Project.

#### **D. Grant Types**

Applications must propose one of the project types specified within the Program Areas and select the appropriate grant type for the application within the constraints of the grant types solicited.

##### **1. Standard Grants**

Standard Grants support targeted original scientific Research, Education, Extension, or Integrated Projects.

##### **2. Conference Grants**

Conference Grants support scientific meetings that bring together scientists to identify research, education, and/or extension needs, update information, or advance an area of science. These activities are recognized as integral parts of scientific efforts. Support for a limited number of meetings covering subject matter encompassed by this solicitation will be considered for partial or, if modest, total support. Individual conference grants are not expected to exceed \$50,000 for one year and are not renewable. Indirect costs are not permitted on Conference Grant awards.

##### **3. Food and Agricultural Science Enhancement Grants**

Food and Agricultural Science Enhancement (FASE) Grants strengthen science capabilities in research, education, and/or extension programs. FASE Grants are designed to help institutions develop competitive projects, and to attract new scientists and educators into careers in high-priority areas of National need in agriculture, food, and environmental sciences. The FASE Grants provide support for Pre- and Postdoctoral Fellowships which will be solicited in a separate NIFA Fellowships Grant Program, New Investigators, and Strengthening Grants. Specific eligibility requirements for these grants are described below.

###### **a. Pre- and Postdoctoral Fellowship Grants**

Doctoral candidates and individuals who will soon receive or have recently received their doctoral degree are encouraged to submit an application for a Pre- or Postdoctoral Fellowship Grant, as appropriate, for research, education, extension, or integrated activities to the NIFA Fellowship Grants program. Program information, including the anticipated release date, is available at [www.nifa.usda.gov/funding/afri/afri.html](http://www.nifa.usda.gov/funding/afri/afri.html).

**b. New Investigator Grants**

An individual who is beginning his/her career, does not have an extensive scientific publication record, and has less than five years postgraduate, career-track experience is encouraged to submit an application for a New Investigator Grant for research, education, and/or extension activities. The new investigator may not have received competitively awarded Federal research funds with the exception of pre- or postdoctoral grants or USDA NRI or AFRI Seed Grants. The application must contain documentation that lists all prior Federal support. The work proposed for New Investigator Grants must address a specific Program Area Priority described under Program Area Descriptions in Part I, C., and the application must be submitted directly to that Program Area by the designated deadline date.

**c. Strengthening Grants**

These funds are expected to enhance institutional capacity with the goal of leading to future funding in the project area, as well as strengthen the competitiveness of the investigator’s research, education, and/or extension activities. Strengthening Grants consist of Standard Grant types (both single-function and multi-function projects) as well as Seed Grants, Equipment Grants, and Sabbatical Grants. The work proposed for Strengthening Grants must address a specific Program Area Priority described under Program Area Descriptions in Part I, C., and the application must be submitted directly to that Program Area by the designated deadline date. All applications submitted for Strengthening Grants must fulfill the eligibility requirements described below.

1) Strengthening Grant Eligibility

Strengthening grants are limited to 1) small and mid-sized or minority-serving degree-granting institutions that previously had limited institutional success for receiving Federal funds or 2) State Agricultural Experiment Stations or degree-granting institutions eligible for USDA Experimental Program for Stimulating Competitive Research (EPSCoR) funding and are eligible for reserved strengthening funds for Research, Education, Extension, and Integrated Project grants. See Figure 1 following Part VIII to assist with determining eligibility for Strengthening Grants.

2) Strengthening Grant Eligibility Definitions

a) **EPSCoR States**

Every year, NIFA determines the states that are eligible for USDA EPSCoR funding. This list includes states having a funding level no higher than the 38<sup>th</sup> percentile of all States based on a 3-year rolling average of AFRI funding levels, excluding FASE Strengthening funds granted to EPSCoR States and small-mid-sized and minority-serving degree-granting institutions. Since this is the fifth year for the AFRI program and complete award data is not available, the eligibility determinations are based on the data obtained from grants made through the AFRI program from FY 2009 through FY 2011. For FY 2013, the following States meet the requirements for this category:

<b>FY 2013 USDA EPSCoR States</b>		
Alabama	Montana	South Carolina
Alaska	Nevada	Utah
Connecticut	New Hampshire	Vermont
Idaho	New Mexico	West Virginia
Kentucky	North Dakota	Wyoming
Maine	Oklahoma	
Mississippi	Rhode Island	

Other entities eligible for USDA EPSCoR funds in FY 2013 include the following United States commonwealths, territories, possessions and their successors, and the District of Columbia:

Other Entities eligible for USDA EPSCoR Funds	
American Samoa	Northern Mariana Islands
District of Columbia	Puerto Rico
Guam	Virgin Islands of the U.S.
Micronesia	

- b) **Small and mid-sized institutions** are academic institutions with a current total enrollment of 17,500 or less, including graduate and undergraduate as well as full- and part-time students. An institution in this instance is an organization that possesses a significant degree of autonomy as defined by being independently accredited in the current version of the Higher Education Directory, published by Higher Education Publications, Inc., 1801 Robert Fulton Drive, Suite 340, Reston, Virginia 20191 (Phone: (888) 349-7715; [www.hepinc.com](http://www.hepinc.com)).
- c) **Minority-serving institutions** are academic institutions whose enrollment of a single minority group or a combination of minority groups (as defined in Part VIII, H) exceeds 50 percent of the total enrollment, including graduate and undergraduate as well as full- and part-time students.

Applicants applying under this category should indicate the current percentage of applicable minority students enrolled at the institution in a cover letter. An institution in this instance is an organization that possesses a significant degree of autonomy as defined by being independently accredited in the current version of the Higher Education Directory, published by Higher Education Publications, Inc., 1801 Robert Fulton Drive, Suite 340, Reston, Virginia 20191 (Phone: (888) 349-7715; [www.hepinc.com](http://www.hepinc.com)). A list of post-secondary minority-serving institutions can be found at [www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html](http://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html).

- d) **Limited institutional success** is defined as institutions that are not among the most successful universities and colleges for receiving Federal funds for science and engineering research and development. See Table 1 following Part VIII for an alphabetical list of the most successful institutions.

All institutions grouped under one main campus as listed in Table 1 following Part VIII, unless located in an EPSCoR state, are excluded from eligibility for all strengthening funds. The institution may petition for an exemption to this rule as described in Part III, B.

### 3) Strengthening Grant Types

An individual applicant may submit only one of the following types of strengthening applications (Sabbatical Grants, Equipment Grants, and Seed Grants) as PD this fiscal year. Investigators are encouraged to contact the Program Area Priority Contact of the appropriate program area priority, regarding suitability of project topics to verify that their submission is appropriate to the program area priority. For Equipment Grants, investigators are also encouraged to contact the appropriate Program Area Priority Contact regarding appropriateness of requested equipment for topics within program area priority requirements.

#### a) **Sabbatical Grants**

Sabbatical Grants are to provide an opportunity for faculty to enhance their research, education, and/or extension capabilities by funding sabbatical leaves. Collaborative arrangements are encouraged. Grants will be limited to one year of salary and funds for travel and supplies, where justified, and are not renewable.

NIFA also encourages and will support the concept of “mini-sabbaticals” for faculty and researchers desiring short-term training to learn new techniques that will improve their competitiveness. These short-term training opportunities generally follow all of the sabbatical requirements described beginning in Part IV, C., but for a shorter duration.



These grants may be used to participate in short courses offered at various research institutions.

b) **Equipment Grants**

Equipment Grants are designed to strengthen the research, education, and/or extension capacity of institutions by funding the purchase of one major piece of equipment. These grants are not intended to replace requests for equipment in individual project applications. Rather, they are intended to help fund items of equipment that will upgrade infrastructure. Requests for computer equipment are allowed only if the equipment is to be used in an activity integral to the proposed project. Requests for computer equipment will not be permitted if the equipment will primarily serve as a word processor or perform administrative functions.

Each request shall be limited to one major piece of equipment within the cost range of \$10,000-\$250,000 and are not renewable. The amount of Federal funding requested shall not exceed 50 percent of the cost or \$50,000, whichever is less. Unless a waiver is granted by NIFA using the criteria listed in Part III, C., it is the responsibility of the PD to secure required matching funds with non-Federal funds (see Part III, C for more information). No installation, maintenance, warranty, or insurance expenses may be paid from these grants, nor may these costs be part of the matching funds. Indirect costs are not permitted on Equipment Grant awards.

c) **Seed Grants**

Seed Grants are to provide funds to enable investigators to collect preliminary data or perform other preliminary activities in preparation for applying for future grants from AFRI. The grants are not intended to fund stand-alone projects, but rather projects that will lead to further work applicable to one of the AFRI Program Areas. Seed Grant applications proposing an Integrated Project only need to include one of the three functions (research, education, extension) and justify how this Seed Grant will allow the applicant to become competitive for future Integrated Project funding.

Seed Grants are limited to a total of \$150,000 (including indirect costs) for two year duration and are not renewable.

d) **Strengthening Standard Grants**

Standard Grant applications that meet the eligibility requirements for Strengthening Grants are eligible for reserved strengthening funds as a Strengthening Standard Grant. The eligibility requirements only apply to the lead PD and are not required for co-PD(s) associated with the project.

## **E. Responsible and Ethical Conduct of Research**

The responsible and ethical conduct of research (RCR) is critical for excellence, as well as public trust, in science and engineering. Consequently, education in RCR is considered essential in the preparation of future scientists. In accordance with sections 2, 3, and 8 of 7 CFR Part 3022, institutions that conduct extramural research funded by USDA must foster an atmosphere conducive to research integrity, bear primary responsibility for prevention and detection of research misconduct and are to maintain and effectively communicate and train their staff regarding policies and procedures. In the event an application to NIFA results in an award, the AOR assures, through acceptance of the award that the institution will comply with the above requirements. Per award terms and conditions, grant recipients shall, upon request, make available to NIFA the policies and procedures as well as documentation to support the conduct of the training.

Note that the training referred to herein shall be either on-campus or the Collaborative Institutional Training Initiative (CITI) program for RCR ([www.citiprogram.org/rcrpage.asp](http://www.citiprogram.org/rcrpage.asp)). The general content of the ethics training, at a minimum, will emphasize three key areas of research ethics: authorship and

plagiarism, data and research integration and reporting misconduct. Each institution will be responsible for developing its own training system, as schools will need flexibility to develop training tailored to their specific student needs. Typically RCR education addresses the topics of: Data Acquisition and Management - collection, accuracy, security, access; Authorship and Publication; Peer Review; Mentor/Trainee Responsibilities; Collaboration; Conflict of Interest; Research Misconduct; Human Subject Research; and Use of Animals in Research.

## **PART III - ELIGIBILITY INFORMATION**

### **A. Eligible Applicants**

Eligibility is linked to the **project type** requested in Program Area Descriptions beginning in Part I, C. All project types are described beginning in Part II, C. Eligible institutions for single-function Research Projects are described in paragraph #1 below. Eligible institutions for multi-functional Integrated Projects are described in paragraph #2 below.

Applicants must respond to the Program Area Priorities and deadlines found in the FY 2013 RFA. Grant recipients may subcontract to organizations not eligible to apply provided such organizations are necessary for the conduct of the project.

#### **1. Research Projects**

Eligible applicants for Research Projects include: 1) State Agricultural Experiment Stations; 2) colleges and universities (including junior colleges offering associate degrees or higher); 3) university research foundations; 4) other research institutions and organizations; 5) Federal agencies, 6) national laboratories; 7) private organizations or corporations; 8) individuals who are U.S. citizens, nationals, or permanent residents; and 9) any group consisting of 2 or more entities identified in 1) through 8). Eligible institutions do not include foreign and international organizations.

#### **2. Integrated Projects**

*Note that ONLY Agriculture, Economics and Rural Communities Program area (Part I, C. 6) is soliciting integrated projects through this RFA*

Eligible applicants for Integrated Projects include: 1) colleges and universities; 2) 1994 Land-Grant Institutions; and (3) Hispanic-serving agricultural colleges and universities.

For Integrated Projects, the terms "college" and "university" mean an educational institution in any state which 1) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate; 2) is legally authorized within such state to provide a program of education beyond secondary education; 3) provides an educational program for which a bachelor's degree or any other higher degree is awarded; 4) is a public or other nonprofit institution; and 5) is accredited by a nationally recognized accrediting agency or association. A research foundation maintained by a college or university is eligible to receive an award under this program.

#### **3. Hispanic-serving Agricultural Colleges and Universities**

Section 7101 of the Food, Conservation, and Energy Act of 2008 (Pub. L. 110-246) amended section 1404 of NARETPA (7 U.S.C. 3103) to create a definition for a new group of cooperating institutions: Hispanic-serving Agricultural Colleges and Universities (HSACUs). HSACUs are colleges and universities that qualify as Hispanic-serving Institutions (HSIs) and offer associate, bachelors, or other accredited degree programs in agriculture-related fields. HSACUs do not include 1862 land-grant institutions.

Pursuant to section 406 of the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) (7 U.S.C. 7626), which authorized the Integrated Research, Education, and Extension Competitive Grant Program, all four-year HSIs are eligible to apply for integrated projects as identified in the FY 2013 AFRI RFA. Two-year HSIs may also be eligible to apply but only if the institution has been certified as a HSACU for the fiscal year in which funding is being provided.

By October 31, 2012, a list of the institutions certified and therefore eligible to apply as HSACUs for grants under FY 2013 RFAs, including this RFA, will be made available at [www.nifa.usda.gov/nea/education/in\\_focus/hispanic\\_if\\_hispanic\\_HSACU.html](http://www.nifa.usda.gov/nea/education/in_focus/hispanic_if_hispanic_HSACU.html). Institutions appearing on this list are granted HSACU certification by the Secretary for the period starting October 1, 2012, and ending September 30, 2013. Certifications are valid for FY 2013 only. Additional questions on HSACU

eligibility can be addressed to Mr. Matthew Lockhart, Senior Policy Specialist, by email at [mlockhart@nifa.usda.gov](mailto:mlockhart@nifa.usda.gov) or phone at (202) 559-5088.

#### 4. **Food and Agricultural Science Enhancement Grants**

The Food and Agricultural Science Enhancement (FASE) Grants have additional eligibility requirements. See Part II, D. 3 for details.

### **B. Request for Determination**

If an applicant's institution can be considered a minority-serving institution and wishes to be considered for a Strengthening Grant (as described in Part II, D. 3. c), but does not serve one or more of the minority groups specified in the Definitions section of this RFA (see Part VIII, H), the applicant must submit to NIFA, documentation supporting the request. This documentation must be submitted as part of the requestor's Letter of Intent (if required) and the application package, and must be received by NIFA by the applicable program deadline. The Secretary of Agriculture or designated individual will determine whether the group or groups identified are eligible under this program.

The Request for Determination as a minority-serving institution must be attached with the Letter of Intent (if required) and the final application. The following information must be provided in the order specified below:

1. A description of each minority group that is being submitted for determination;
2. Data or studies supporting this group's designation as a minority group; and
3. Data indicating that enrollment of the minority group(s) exceeds 50 percent of the total enrollment at the academic institution, including graduate and undergraduate and full- and part-time students.

All institutions grouped under one main campus as listed in Table 1 following Part VIII, unless located in an EPSCoR state (listed in Part II, D. 3. c. 2 a.), are excluded from eligibility for all strengthening funds. However, if any campus within a multi-campus listing can provide information demonstrating that it is administratively independent or has an independent accreditation, then the institution may petition for an exemption to this rule and request eligibility for strengthening funds. The Letter of Intent (if required) and the application must include a letter indicating how the institution is independent of the main campus, either through accreditation or administration. In addition, the letter should stipulate that the institution is eligible as a small and mid-sized or minority-serving institution due to enrollment and total federal funds received for science and engineering research and development. The letter must be signed by the Authorized Representative (AR) and included with the Letter of Intent (if required) and the completed application.

### **C. Cost Sharing or Matching**

**For Equipment Grants:** The amount of Federal funds provided may not exceed 50 percent of the cost of the equipment acquired using funds from the grant, or \$50,000, whichever is less. Grantees are required to match 100 percent of Federal funds awarded from non-Federal sources. The Secretary may waive all or part of the matching requirement if all three of the following criteria are met: 1) applicants must be a college, university, or research foundation maintained by a college or university that ranks in the lowest one third of such colleges, universities, and research foundations on the basis of Federal research funds received (see Table 2 following Part VIII for eligibility); 2) if the equipment to be acquired using funds from the grant costs not more than \$25,000; and 3) has multiple uses within a single research project or is usable in more than one research project. If the institution believes it is eligible for the waiver for matching funds, the budget justification must include a letter signed by the institution's AR stating this information.

If **applied Research and Integrated Projects** are commodity-specific and not of national scope, the grant recipient is required to match the USDA funds awarded on a dollar-for-dollar basis from non-Federal sources with cash and/or in-kind contributions.

## PART IV – APPLICATION AND SUBMISSION INFORMATION

### A. Letter of Intent Instructions

Certain Program Areas within the AFRI Foundational Program Area require a Letter of Intent for submission of an application. Refer to the Program Area Descriptions beginning in Part I, C for Letter of Intent deadlines for a specific Program Area.

Failure to follow the guidelines below may result in the Letter of Intent being removed from consideration.

1. The Letter of Intent must adhere to the following formatting guidelines:
  - a. Font size must be at least 12 point
  - b. Margins must be at least one inch in all directions
  - c. Line spacing must not exceed six lines of text per vertical inch
2. The Letter of Intent is limited to **two pages** for all project and grant types
  - a. On Page 1, provide **only** the following information:
    - i. the name, professional title, department, institution and e-mail address of the lead project director (PD) and name, professional title, department, and institution of all collaborating investigators
    - ii. the Program Area and the Priority Area within that Program Area most closely addressed in the application
  - b. On Page 2, include:
    - i. a descriptive title
    - ii. rationale
    - iii. overall hypothesis or goal
    - iv. specific objectives
    - v. approach
    - vi. potential impact and expected outcomes
3. NIFA will only accept Letters of Intent in the portable document format (PDF). Attach the PDF Letter of Intent to an e-mail addressed to the appropriate Program Area e-mail for Submission of Letter of Intent. In the e-mail subject line write: *Letter of Intent [Program Area Priority Code] \_ [PD's Last Name]*.
4. For those programs requiring a Letter of Intent, a letter is required for **all** grant types except Conference Grant applications. See Part II, D for a detailed description of grant types.
5. Submission of more than one Letter of Intent to a program (area priority) is discouraged.
6. An acknowledgement receipt will be sent by replying to the sender within 5 business days.
7. Letters of Intent will be reviewed by scientific program staff in order to plan for appropriate expertise for the peer review panel and ensure that the proposed project fits appropriately within the Program Area Priorities.
8. Within three weeks after the Letter of Intent deadline, the PD will receive a response from the Program Area Priority Contact.
9. Where a Letter of Intent is required, applications submitted without a prior Letter of Intent submission will not be reviewed.
10. Applicants must notify the appropriate Program Area Priority Contact of any changes to project key personnel, title, or objectives from the Letter of Intent to the submission of a full application.

## B. Electronic Application Package

Only electronic applications may be submitted via Grants.gov to NIFA in response to this RFA. **Applicants are advised to submit early to the Grants.gov system.**

### New Users of Grants.gov

Prior to preparing an application, it is suggested that the PD/PI first contact an Authorized Representative ((AR) (also referred to as Authorized Organizational Representative or AOR)) to determine if the organization is prepared to submit electronic applications through Grant.gov. If the organization is not prepared (e.g., the institution/organization is new to the electronic grant application process through Grants.gov), then the one-time registration process must be completed PRIOR to submitting an application. It can take as much as two weeks to complete the registration process so it is critical to begin as soon as possible. In such situations the AR should go to **“Get Registered” on the Grants.gov left navigation bar (or go to [www.grants.gov/applicants/get\\_registered.jsp](http://www.grants.gov/applicants/get_registered.jsp)) for information on registering the institution/organization with Grants.gov. A quick reference guide listing the steps is available as a 4-page PDF document at the following website: [www.grants.gov/assets/Grants.govRegistrationBrochure.pdf](http://www.grants.gov/assets/Grants.govRegistrationBrochure.pdf). Item 2. below mentions the “NIFA Grants.gov Application Guide.” Part II.1. of the NIFA Grants.gov Application Guide contains additional explanatory language regarding the registration process.**

### Steps to Obtain Application Package Materials

The steps to access application materials are as follows:

1. In order to access, complete and submit applications, applicants must download and install a version of Adobe Reader compatible with Grants.gov. This software is essential to apply for NIFA Federal assistance awards. For basic system requirements and download instructions, please see [www.grants.gov/help/download\\_software.jsp](http://www.grants.gov/help/download_software.jsp). To verify that you have a compatible version of Adobe Reader, Grants.gov established a test package that will assist you in making that determination. Grants.gov Adobe Versioning Test Package: [www.grants.gov/applicants/AdobeVersioningTestOnly.jsp](http://www.grants.gov/applicants/AdobeVersioningTestOnly.jsp).
2. The application package must be obtained via Grants.gov, go to [www.grants.gov](http://www.grants.gov), click on “Apply for Grants” in the left-hand column, click on **“Step 1: Download a Grant Application Package and Instructions,”** enter the funding opportunity number **USDA-NIFA-AFRI-003958** in the appropriate box and click “Download Package.” From the search results, click “Download” to access the application package.

Contained within the application package is the “NIFA Grants.gov Application Guide: A Guide for Preparation and Submission of NIFA Applications via Grants.gov.” This Guide contains an introduction and general Grants.gov instructions, information about how to use a Grant Application Package in Grants.gov, and instructions on how to complete the application forms.

**If assistance is needed to access the application package** (e.g., downloading or navigating Adobe forms), **or submitting the application** then refer to resources available on the Grants.gov Web site first ([www.grants.gov](http://www.grants.gov)). Grants.gov assistance is also available as follows:

Grants.gov customer support  
1-800-518-4726 Toll-Free or 606-545-5035  
Business Hours: 24 hours a day, 7 days a week. Closed on [Federal Holidays](#).  
Email: [support@grants.gov](mailto:support@grants.gov)  
Grants.gov iPortal: Top 10 requested help topics (FAQs), Searchable knowledge base, self service ticketing and ticket status, and live web chat (available 7:00 a.m. - 9:00 p.m. ET). Get help now!

Please have the following information available when contacting Grants.gov, to help expedite your inquiry:

- Funding Opportunity Number (FON)
- Name of Agency You Are Applying To
- Specific Area of Concern

See [http://grants.gov/applicants/app\\_help\\_reso.jsp](http://grants.gov/applicants/app_help_reso.jsp) or [www.nifa.usda.gov/funding/electronic.html](http://www.nifa.usda.gov/funding/electronic.html) for additional resources for applying electronically.

### C. Content and Form of Application Submission

Electronic applications should be prepared following Parts V and VI of the document entitled “A Guide for Preparation and Submission of NIFA Applications via Grants.gov.” This guide is part of the corresponding application package (see Section A. of this Part). The following is **additional information** needed in order to prepare an application in response to this RFA. **If there is discrepancy between the two documents, the information contained in this RFA is overriding.**

**Note the attachment requirements (e.g., portable document format) in Part III section 3. of the Guide. ANY PROPOSALS THAT ARE NON-COMPLIANT WITH THE REQUIREMENTS (i.e., content format, PDF file format, file name restrictions, and no password protected files) WILL BE AT RISK OF BEING EXCLUDED FROM NIFA REVIEW.** Partial applications will be excluded from NIFA review. With documented prior approval, subsequent submissions of an application will be accepted until close of business on the closing date in the RFA.

**If you do not own PDF-generating software, Grants.gov provides online tools to assist applicants. Users will find a link to “Convert Documents to PDF” on [http://grants.gov/help/download\\_software.jsp#pdf\\_conversion\\_programs](http://grants.gov/help/download_software.jsp#pdf_conversion_programs).**

**For any questions related to the preparation of an application** please review the NIFA Grants.gov Application Guide and the applicable request for applications. If assistance is still needed for preparing application forms content, contact:

- Email: [electronic@nifa.usda.gov](mailto:electronic@nifa.usda.gov)
- Phone: 202-401-5048
- Business hours: Monday through Friday, 7:00 a.m. – 5:00 p.m. Eastern Time, excluding Federal holidays.

All application information provided herein is general for all Project and Grant Types. However, some types require different information. These differences are noted by a ☼ symbol. Proper preparation of an application will assist reviewers in evaluating the merits of each application in a systematic, consistent fashion.

#### 1. **SF 424 R&R Cover Sheet**

Instructions related to this form are explained in detail in Part V, 2. of the NIFA Grants.gov Application Guide.

**a. Field 12. Proposed Project** – For the start date of the project, select a date at least six months after the submission deadline date for the program. Choose the end date to correspond to the correct duration of the project.

**b. Field 20. Pre-application** – Do not fill out this portion of the form. While AFRI is not accepting pre-applications in FY 2013 in any of the programs, the Program Areas under this RFA require a Letter of Intent. See the Program Area Descriptions in Part I, C and Part IV, A for more details.



2. **SF 424 R&R Project/Performance Site Location(s)**

Instructions related to this form are explained in detail in Part V, 3. of the NIFA Grants.gov Application Guide.

3. **R&R Other Project Information**

Instructions related to this form are explained in detail in Part V, 4. of the NIFA Grants.gov Application Guide.

**a. Fields 1 and 2. Are Human Subjects Involved? and Are Vertebrate Animals Used?**

☼ *For Sabbatical Grant Applications* – Applicants whose research requires use of human subjects or vertebrate animals must have their project reviewed by the appropriate committee(s) at the institution where the research will be conducted.

**b. Field 7. Project Summary/Abstract – PDF Attachment.** The Project Summary is limited to **250 words**. Title the attachment as 'Project Summary' in the document header and save file as 'ProjectSummary'. See Part V, 4.7 of NIFA Grants.gov Application Guide for further instructions.

A recommended template for the Project Summary/Abstract can be found at:  
[www.nifa.usda.gov/funding/templates/project\\_summary.doc](http://www.nifa.usda.gov/funding/templates/project_summary.doc).

The Project Summary must list the names and institutions of the PD and co-PDs and **indicate which specific FY 2013 Program Area Priority the proposed project addresses**. Program Area Priorities are stated within each Program Area Description (see Part I, C). Applications that do not address at least one Program Area Priority will not be reviewed.

☼ *For Conference Grant Applications* – State the objectives of the conference, symposium, or workshop, as well as the proposed location and probable inclusive date(s) of the conference. Please state in the summary the specific Program Area Priority to which the project applies.

☼ *For Sabbatical Grant Applications* – Indicate overall project goals and supporting objectives.

☼ *For Equipment Grant Applications* – Indicate equipment sought and overall project goals for its use.

**c. Field 8. Project Narrative – PDF Attachment. 18-Page or 7-Page Limit** (explained below). Title the attachment as 'Project Narrative' in the document header and save file as 'ProjectNarrative'. For Standard Research, Standard Integrated, Conference, New Investigator and Strengthening Standard, Grant applications, the Project Narrative section may not exceed a total of 18 pages with 12-point font and line spacing not exceeding six lines of text per vertical inch, including all figures and tables.

For Sabbatical, Equipment, and Seed Grant applications, the Project Narrative section may not exceed a total of 7 pages with 12-point font and line spacing not exceeding six lines of text per vertical inch, including all figures and tables.

To ensure fair and equitable competition, applications exceeding the applicable page limitation will be returned without review.

Each Project Narrative is expected to be complete; however, preprints (see Part IV, C. 4. g) related to the Project Narrative are allowed if they are directly germane to the proposed project. Information may not be appended to an application to circumvent page limitations prescribed for the Project Narrative. **Extraneous materials will not be used during the peer review process.**



**Project Narrative must include all of the following:**

- 1) Response to Previous Review (if applicable)  
This requirement only applies to Resubmitted Applications as described in Part II, B. The Project Narrative attachment should include two components: 1) a one-page response to the previous review panel summary titled "Response to Previous Review" included as the first page of the Project Narrative attachment and 2) the **7- or 18-page** Project Narrative, as required (see Part IV, C. 4. c above).
- 2) Introduction  
Include a clear statement of the long-term goal(s) and supporting objectives of the proposed project. Summarize the body of knowledge or past activities that substantiate the need for the proposed project. Describe ongoing or recently completed activities significant to the proposed project including the work of key project personnel. Include preliminary data/information pertinent to the proposed project. All works cited should be referenced (see Bibliography & References Cited in Part IV, C. 4. d).
- 3) Rationale and Significance
  - a) Concisely present the rationale behind the proposed project;
  - b) Describe the specific relationship of the project's objectives to one of the Program Area Priorities. Applications that do not address at least one Program Area Priority will not be reviewed; and
  - c) The potential long-range improvement in and sustainability of U.S. agriculture and food systems should be shown clearly. These purposes are described under Purpose and Priorities in Part I, B. Any novel ideas or contributions that the proposed project offers should also be discussed in this section.
- 4) Approach  
The activities proposed or problems being addressed must be clearly stated and the approaches applied are to be clearly described. Specifically, this section must include:
  - a) A description of the activities proposed and the sequence in which the activities are to be performed;
  - b) Methods to be used in carrying out the proposed project, including the feasibility of the methods;
  - c) Expected outcomes;
  - d) Means by which results will be analyzed, assessed, or interpreted;
  - e) How results or products will be used;
  - f) Pitfalls that may be encountered;
  - g) Limitations to proposed procedures;
  - h) A full explanation of any materials, procedures, situations, or activities related to the project that may be hazardous to personnel, along with an outline or precautions to be exercised to avoid or mitigate the effects of such hazards; and
  - i) A timeline for attainment of objectives and for production of deliverables that includes annual milestones with specific, measurable outcomes.

☀ *For Integrated Project Applications –*

- Integrated Project applications must include at least two of the three functions of the agricultural knowledge system (i.e., research, education, and extension). Each function should be represented by one or more objectives within the application.
- Projects must budget sufficient resources to carry out the proposed set of research, education, and/or extension activities that will lead to the desired outcomes. No more than two-thirds of a project's budget may be focused on a single function.
- Integrated Projects must include individuals on the project team with significant expertise in each component of the project (research, education, and/or extension).
- A plan for evaluating progress toward achieving project objectives must be included. The plan must include milestones, which signify the completion of a major deliverable, event, or

accomplishment and serve to verify that the project is on schedule and on track for successful conclusion. The plan should also include descriptions of indicators that you will measure to evaluate whether the research, education, and/or extension activities are successful in achieving project goals and in contributing to achievement of the stated program goals and outcomes.

- In addition to the Project Narrative requirements above, the proposed Integrated Project should clearly articulate:
  - Stakeholder involvement in project development, implementation, and evaluation, where appropriate;
  - Objectives for each function included in the project (note that extension and education activities are expected to differ and to be described in separate project objectives; see enumerated descriptions in Part II, C.); and
  - A dissemination plan describing the methods that will be used to communicate findings and project accomplishments.
- AFRI encourages Integrated Projects that develop content suitable for delivery through eXtension. This content is for “end users” as opposed to staff development and must follow the eXtension Guiding Principles and guidelines for including eXtension in a proposal presented at [http://about.extension.org/wiki/NIFA\\_RFA\\_Information](http://about.extension.org/wiki/NIFA_RFA_Information). Funds may be used to 1) enhance an existing Community of Practice or 2) to establish a new Community of Practice, as appropriate.
- AFRI encourages Integrated Projects that are suitable for 4-H audiences and stakeholder groups while meeting identified program priorities. The 4-H Youth Development is the programmatic outreach of the Land Grant Universities and Institutions to our youngest citizens in their communities and provides opportunities for youth to develop skills, practical knowledge, and wisdom with an emphasis on practical application of knowledge or “learning by doing.” By engaging 4-H in AFRI projects, applicants engage young people as citizen scientists; increase their awareness of the role of agriculture; and prepare young people for higher education and the 21st century work environment. Opportunities for engaging 4-H in AFRI proposals should align with the 4-H Mission Mandates of Science, Engineering and Technology; Healthy Living; and Citizenship. See guiding principles at [www.national4-hheadquarters.gov](http://www.national4-hheadquarters.gov) or contact your university Cooperative Extension headquarters and/or State 4-H Program Office.

☼ *For Conference Grant Applications* – In addition to the Project Narrative requirements above, substitute the following in the Approach section:

- A justification for the meeting;
- Recent meetings on the same subject with dates and locations;
- Names and organizational affiliations of the chair and other members of the organizing committee;
- A proposed program (or agenda) for the conference, including a listing of scheduled participants and their institutional affiliations; and
- The method of announcement or invitation that will be used.

☼ *For Sabbatical Grant Applications* – In addition to the Project Narrative requirements above, substitute the following in the Approach section:

- A general description of the research, education, and/or extension interests and goals of the applicant in order to provide perspective for the application;
- A description of the project to be pursued while on the sabbatical leave;
- A statement of how the sabbatical leave will enhance the capabilities of the applicant; and
- A statement of future research goals and objectives once the sabbatical is complete and how the sabbatical will enable the applicant to pursue these goals.

☼ *For Equipment Grant Applications* – In addition to the Project Narrative requirements above, include a general description of the project(s) for which the equipment will be used, how the equipment will fit into or enhance the research, education, and/or extension program, and how the equipment will allow the applicant to become competitive for future funding or move into new research areas. Also include a description of other similar or complementary equipment available to the PD at the institution and why the requested equipment is necessary.

☀ *For Seed Grant Applications* – Include all of the components detailed in the Project Narrative section above and present enough detail to allow adequate evaluation. In order to be competitive, long-term goals and a statement describing how this Seed Grant will allow the applicant to become competitive for future funding must be included.

**d. Field 9. Bibliography & References Cited – PDF Attachment. No Page Limit.** Title the attachment as 'Bibliography & References Cited' in the document header and save file as 'BibliographyReferencesCited'.

All work cited in the text should be referenced in this section of the application. All references must be complete; include titles and all co-authors; conform to an acceptable journal format; and be listed in alphabetical order using the last name of the first author or listed by number in the order of citation.

**e. Field 10. Facilities & Other Resources – PDF Attachment. No Page Limit.** Title the attachment as 'Facilities & Other Resources' in the document header and save file as 'FacilitiesOtherResources'.

**f. Field 11. Equipment – PDF Attachment. No Page Limit.** Title the attachment as 'Equipment' in the document header and save file as 'Equipment'.

In addition to describing available equipment, items of nonexpendable equipment necessary to conduct and successfully complete the proposed project should be listed in Field C. of the R&R Budget and described in the Budget Justification (Field K. of the R&R Budget).

**g. Field 12. Other Attachments**

- 1) **Project Type – PDF Attachment. 1-Page Limit.** Title the attachment as 'Project Type' and save file as 'ProjectType'.

Identify the type of project and the type of grant you are submitting by completing the Project Type template located at: [www.nifa.usda.gov/funding/templates/project\\_type.doc](http://www.nifa.usda.gov/funding/templates/project_type.doc). Before doing so, however, please refer to Part I, C of this RFA to determine which project types are requested under each Program Area Description. Also please see Part II of this RFA for a full description of each project and grant type.

- 2) **Key Personnel Roles – PDF Attachment. 2-Page Limit.** Title the attachment as 'Key Personnel' and save file as 'KeyPersonnel'.

Clearly describe the roles and responsibilities of the PD, co-PD(s), collaborator(s), and other key personnel. Biographical sketches for key personnel should be attached in the R&R Senior/Key Person Profile described in Part IV, C. 5. If it will be necessary to enter into formal consulting or collaborative arrangements with others, such arrangements should be fully explained and justified. If the consultant(s) or collaborator(s) are known at the time of application, a biographical sketch should be provided in the R&R Senior/Key Person Profile. Collaborators simply providing services or materials should not be listed in the R&R Senior/Key Person Profile and a biographical sketch is not required. Evidence (letters of support) for this type of collaboration should be provided in the 'Documentation of Collaboration' (see number 5 below). These signed letters should provide evidence that the collaborators involved have agreed to render these services.

☀ *For Integrated Grant Applications* – state for key personnel an estimate of the percent of time devoted to research, education, and/or extension activities.

- 3) *Logic Model* – **PDF Attachment. Required for Integrated Project Grants Only. Allowable for Research Projects. 2-Page Limit.** Title the attachment as 'Logic Model' and save file as 'LogicModel'.

Applications proposing Education, Extension, or Integrated Projects must include the elements of a logic model detailing the activities, outputs, and outcomes of the proposed project. The logic model planning process is a tool that should be used to develop your project before writing your application. This information may be provided as a narrative or formatted into a logic model chart. More information and resources related to the logic model planning process are provided at [www.nifa.usda.gov/funding/integrated/integrated\\_logic\\_model.html](http://www.nifa.usda.gov/funding/integrated/integrated_logic_model.html).

- 4) *Management Plan* – **PDF Attachment. Required for Integrated Project Grants Only. Allowable for Research Projects. 3-Page Limit.** Title the attachment as 'Management Plan' and save file as 'ManagementPlan'.

The application must contain a clearly articulated project management plan to ensure efficient functioning of the team that includes an organizational chart, administrative timeline, and a description of how the project will be governed, as well as a strategy to enhance coordination, collaboration, communication, and data sharing and reporting among members of the project team and stakeholder groups. Applications must include a plan for sustaining the program beyond the termination of the project.

The management plan should also include an advisory group of principal stakeholders, partners, and professionals to assess and evaluate the quality, expected measurable outcomes, and potential impacts for the proposed research, education, and/or extension. Please include letters of commitment (in Documentation of Collaboration below), rationale for their role, and how they will function effectively to support the goals and objectives of the project. The plan must demonstrate how partners and stakeholders contribute to project assessment on an annual basis.

- 5) *Documentation of Collaboration* – **PDF Attachment. No Page Limit.** Title the attachment as 'Documentation of Collaboration' in the document header and save file as 'Collaboration'.

Evidence, e.g., letter(s) of support, should be provided that the collaborators involved have agreed to render services. The applicant also will be required to provide additional information on consultants and collaborators in the budget portion of the application.

☼ *For Sabbatical Grant Applications* – Provide documentation that arrangements have been made with an established investigator(s) to serve as host, including:

- A letter from the home institution detailing the particular arrangements at the home institution with respect to salary and date and duration of sabbatical;
- A letter from the scientific host(s) indicating willingness to serve in this capacity and a description of the host's contribution to the proposed activities both scientifically and with regard to use of facilities and equipment; and
- A statement signed by the Department Head or equivalent official at the host institution indicating a commitment to provide research space and facilities for the period of the applicant's presence.

☼ *For Equipment Grant Applications* – The application must contain a letter(s) from the organization(s) committed to providing the non-Federal matching funds. Provide evidence of institutional commitment for operation and maintenance of requested equipment. Arrangements for sharing equipment among faculty are encouraged. However, it must be evident that the PD is a principal user of the requested equipment.

- 6) *Preprints* – **PDF Attachment. Limited to 2 preprints.** Title the attachment as ‘Preprints’ in the document header and save file as ‘Preprints’.

Preprints related to the Project Narrative are allowed if they are directly germane to the proposed project. Information may not be appended to an application to circumvent page limitations prescribed for the Project Narrative. **Extraneous materials will not be used during the peer review process.** Only manuscripts in press for a peer-reviewed journal will be accepted and must be accompanied by letters of acceptance from the publishing journals). Preprints attached in support of the application should be **single-spaced**. Each preprint must be identified with the name of the submitting organization, the name(s) of the PD(s), and the title of the application.

4. **R&R Senior/Key Person Profile (Expanded)**

Information related to the questions on this form is dealt with in detail in Part V, 5. of the NIFA Grants.gov Application Guide.

A Senior/Key Person Profile should be completed for the PD and each co-PD, senior associate, and other professional personnel, including collaborators playing an active role in the project. Collaborators only providing services or materials should not be listed in the R&R Senior/Key Person Profile. Evidence (letters of support) for this type of collaboration should be provided in the Documentation of Collaboration (see Part IV, C. 4. g. 5).

a. **Project Role Field** – Complete appropriately.

☼ *For Sabbatical Grant Applications* – Select “PD/PI” for the Sabbatical Grant applicant. Select “Other” for the corresponding scientific host(s) and any other personnel whose qualification merit consideration in the evaluation of the application.

☼ *For Equipment Grant Applications* – Select “PD/PI” for the Equipment Grant applicant. Select “Faculty” for the other major users of the equipment.

b. **Other Project Role Category Field** – Complete appropriately, if applicable.

c. **Attach Biographical Sketch Field – PDF Attachment. 2-Page Limit** (excluding publications listings) per PD, co-PD, senior associate, and other professional personnel. Title the attachment as ‘Biographical Sketch’ in the document header and save file as ‘BiographicalSketch’.

A biographical sketch (vitae) of the PD and each co-PD, senior associate, and other professional personnel should be included.

The Conflict of Interest list should not be included in the biographical sketch, but it must be provided as a separate document (see Part IV, C. 8. c for more information).

☼ *For Sabbatical Grant Applications* – A Biographical Sketch must be submitted for the Sabbatical Grant applicant, the scientific host(s), and any other personnel whose qualifications merit consideration in the evaluation of the application.

☼ *For Equipment Grant Applications* – A Biographical Sketch for both the Equipment Grant applicant and other major users of the equipment must be submitted.

d. **Attach Current and Pending Support Field – PDF Attachment. No Page Limit.** Title the attachment as ‘Current and Pending Support’ in the document header and save file as ‘CurrentPendingSupport’.

A recommended template for the Current and Pending Support can be found at:  
[www.nifa.usda.gov/funding/templates/current\\_pending.doc](http://www.nifa.usda.gov/funding/templates/current_pending.doc).

Current and Pending Support information is only required for personnel with PD or co-PD indicated as their Project Role on the R&R Senior/Key Person Profile. All applications must contain a list of all Current and Pending Support detailing public or private support (including in-house support) to which personnel identified in the application have committed portions of their time, whether or not salary support for person(s) involved is included in the budget. Please note that the project being proposed should be included in the pending section of the form. Total project listed for each PD should be indicated as percent effort and not exceeds 100% for concurrent (Current and Pending) projects.

The AFRI program will not fund an application that duplicates or overlaps substantially with other NIFA funding (including non-competitive funds such as Special Grants or Hatch formula funds) or other Federal funding. As an addendum to the Current and Pending Support, provide a brief summary for any completed, current, or pending projects that appear similar to the current application, especially previous NRI or AFRI awards.

☼ *For Sabbatical Grant Applications* – Current and Pending Support for both the Sabbatical Grant applicant and the scientific host(s) (as documentation of on-going work in the host's laboratory) must be completed.

☼ *For Equipment Grant Applications* – Current and Pending Support for both the Equipment Grant applicant and other major users of the equipment must be completed. If the applicant has significant funding from other sources, a justification must be provided in the Project Narrative for how this equipment will strengthen the applicant's research program or institution.

**5. R&R Personal Data**

As noted in Part V, 6. of the NIFA Grants.gov Application Guide, the submission of this information is voluntary and is not a precondition of award.

**6. R&R Budget**

Information related to the question on this form is dealt with in detail in Part V, 7. of the NIFA Grants.gov Application Guide.

**a. Budget Periods.** Applications must contain a budget for each budget period for the entire duration of the proposed project. Annual and cumulative budgets are required.

If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings for the duration of the award (excluding Conference, Sabbatical, and Equipment Grant applications). Seed Grant applications are required to attend beginning in the second year of funding. Reasonable travel expenses should be included as part of the project budget.

☼ *For Integrated Project Applications* – Projects must budget sufficient resources to carry out the proposed set of research, education, and/or extension activities that will lead to the desired outcomes. No more than two-thirds of a project's budget may be focused on a single component. Projects that include partnering with eXtension must include financial support for the Community of Practice core functions as well as project-specific activities.

☼ *For Conference Grant Applications* – The budget for the conference may include an appropriate amount for transportation and subsistence costs for participants and for other conference-related costs. Conference awards are not expected to exceed \$50,000 and are not renewable. Indirect costs are not permitted on Conference Grant awards. Include an itemized breakdown of all support requested from the AFRI in the Budget Justification (Field K. of the R&R Budget).

☼ *For Sabbatical Grant Applications* – Limit to one year's salary and funds for travel and supplies.

☼ *For Equipment Grant Applications* – Each request shall be limited to one major piece of equipment within the cost range of \$10,000-\$250,000. Equipment grants are not renewable. The amount

requested shall not exceed 50 percent of the cost or \$50,000, whichever is less. Unless waived, it is the responsibility of the PD to secure the required matching funds with non-Federal funds (see Part III, C for more information). No installation, maintenance, warranty, or insurance expenses may be paid from these awards, nor may these costs be part of the matching funds. Indirect costs are not permitted on Equipment Grant awards.

☼ *For Seed Grant Applications* – These awards will be limited to a total of \$150,000 (including indirect costs) for two years and are not renewable.

**b. Field H. Indirect Costs** – NIFA is prohibited from paying indirect costs exceeding 30 percent of the total Federal funds provided under each award. This limitation is equivalent to 0. 42857 of the total direct costs of an award. See Part IV, E for additional information.

**c. Field K. Budget Justification – PDF Attachment. No Page Limit.** Title the attachment as 'Budget Justification' in the document header and save file as 'BudgetJustification'.

All cumulative budget categories, with the exception of Indirect Costs, for which support is requested must be individually listed (with costs) in the same order as the cumulative budget. NOTE: For continuation awards, all budget categories for year one must also be fully justified. If consulting, collaborative, or subcontractual arrangements are included in the application, these arrangements should be fully explained and justified. The rate of pay for any consultant must be included, if known at the time of application. Please include a cost breakdown for the consultant, including the number of days in service, travel, and per diem, as well as the rate of pay. Letters of consent or collaboration and other evidence should be provided in the Documentation of Collaboration (see Part IV, C. 4. g. 5) to show that collaborators have agreed to participate. A proposed statement of work, biographical sketch, and a budget for each arrangement involving the transfer of substantive programmatic work or the provision of financial assistance to a third party must be supplied. In multi-institutional applications, a budget and budget narrative must be included for each institution involved. The lead institution and each participating institution must be identified.

☼ *For Integrated Project Applications* – Each function should be represented by one or more objectives within the application. Projects must budget sufficient resources to carry out the proposed set of research, education, and/or extension activities that will lead to the desired outcomes. No more than two-thirds of a project's budget may be focused on a single component.

☼ *For Equipment Grant Applications* – The Budget Justification should describe the instrument requested including the manufacturer and model number, if known; provide a detailed budget breakdown of the equipment and accessories required; and indicate the amount of funding requested from USDA for each component of equipment requested. A letter signed by the institution's AR stating that the necessary non-Federal matching funds will be made available from an institutional or other source is required. An institution that believes it is eligible for the waiver of the matching funds should include a letter stating and documenting the eligibility that is signed by the institution's AR (see Table 2 following Part VIII for eligibility). A justification must be given for how this equipment will strengthen the applicant's research program or institution.

#### **d. Subcontract Arrangements**

If it will be necessary to enter into a formal subcontract agreement with another institution, financial arrangements must be detailed in the "R&R Subaward Budget Attachment(s) Form." Annual and cumulative budgets, budget justification and a letter of commitment signed by the Authorized Representative (AR) are required for each subcontract agreement. Refer to Part V, 8. of the NIFA Grants.gov Application Guide for instructions on completing this form.

#### **e. Matching**

**Equipment Grants** requiring matching funds, as specified in Part III, C., must include a letter in the budget justification signed by the institution's AR stating that the necessary non-Federal matching funds will be made available from the institution or other source. The amount of Federal funds



provided may not exceed 50 percent of the cost of the equipment acquired using funds from the grant, or \$50,000, whichever is less. Grantees are required to match 100% of federal funds awarded from non-Federal sources. If the institution believes it is eligible for the waiver for matching funds (see Part III, C. for waiver eligibility), the budget justification must include a letter signed by the institution's AR stating this information. NIFA will consider this justification when ascertaining final matching requirements or in determining if required matching can be waived. NIFA retains the right to make final determinations regarding matching requirements.

If a funded project is commodity-specific and not of national scope, the grant recipient is required to match the USDA funds awarded on a dollar-for-dollar basis from non-Federal sources with cash and/or in-kind contributions.

The sources and the amount of all matching support from outside the applicant organization should be summarized on a separate page and placed in the application immediately following the Budget Justification. All pledge agreements must be placed in the application immediately following the summary of matching support.

The value of applicant contributions to the project shall be established in accordance with applicable cost principles. Applicants should refer to OMB Circular A-21 (2 CFR Part 220), Cost Principles for Educational Institutions, for further guidance and other requirements relating to matching and allowable costs.

#### 7. **Supplemental Information Form**

Information related to the questions on this form is dealt with in detail in Part VI, 1. of the NIFA Grants.gov Application Guide.

**a. Field 2. Program to which you are applying** – Enter the Program (Area Priority) Code Name and the Program (Area Priority) Code for the Program Area Priority to which you are applying from the information provided in the Program Area Descriptions beginning in Part I, C. An application can only be submitted to one program (Area Priority). It is extremely important that the Program (Area Priority) Code Name and Program (Area Priority) Code are spelled correctly and match this RFA. If you have a question about which topic area is appropriate for your application, please contact the Program Area Priority Contact.

**b. Field 8. Conflict of Interest List – PDF Attachment. No Page Limit.** Title the attachment as 'Conflict of Interest' in the document header and save file as 'ConflictofInterest'. See Part VI, 1.8 of the NIFA Grants.gov Application Guide for further instructions.

A Conflict of Interest List is required for all applications submitted to the AFRI. The Conflict of Interest List should be provided as a separate PDF attachment and not included in the vitae or resume. A Conflict of Interest List must be completed individually for all personnel who have submitted a Biographical Sketch in the R&R Senior/Key Personnel Profile. **Collate all individual Conflict of Interest lists into a single document file.** The lists can only be submitted as a single PDF attachment.

A recommended template for the Conflict of Interest List can be found at:  
[www.nifa.usda.gov/funding/templates/conflict\\_of\\_interest.doc](http://www.nifa.usda.gov/funding/templates/conflict_of_interest.doc).

☼ *For Equipment Grant Applications* – Conflict of Interest list for the Equipment Grant applicant and other major users of the equipment must be completed.

#### **D. Submission Dates and Time**

Instructions for submitting an application are included in Part IV, Section 1.9 of the NIFA Grants.gov Application Guide.

Applications must be received by Grants.gov by 5:00 p.m. ET on the dates indicated in the Program Area Descriptions beginning in Part I, C. **Applications received after the applicable deadlines will not be reviewed.**

**Applicants who have problems with the submission of an application Grants.gov are encouraged to FIRST contact the Grants.gov Help Desk to resolve any problems. Keep a record of any such correspondence. See Part IV. A. for Grants.gov contact information.**

Correspondence regarding submitted applications will be sent using e-mail. Therefore, applicants are strongly encouraged to provide accurate e-mail addresses, where designated, on the SF-424 R&R Application for Federal Assistance.

If the AR has not received correspondence **from NIFA** regarding a submitted application within 30 days of the established deadline, please contact the Program Area Contact identified in Part VII of the applicable RFA and request the proposal number assigned to the application. **Failure to do so may result in the application not being considered for funding by the peer review panel. Once the application has been assigned a proposal number, this number should be cited on all future correspondence.**

## **E. Funding Restrictions**

Section 7132 of the Food, Conservation, and Energy Act of 2008 (Pub. L. 110-246) amended section 1462(a) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3310(a)) on recovery of indirect costs. The recovery of indirect costs on awards made by NIFA under this program may not exceed the lesser of the institution's official negotiated indirect cost rate or the equivalent of 30 percent of total Federal funds awarded.

Funds made available for grants under the AFRI program shall not be used for the construction of a new building or facility or the acquisition, expansion, remodeling, or alteration of an existing building or facility (including site grading and improvement, and architect fees).

## **F. Other Submission Requirements**

### **1. Proper Application Submission**

**The applicant must follow the submission requirements noted in Part IV, section 1.9 in the document entitled “NIFA Grants.gov Application Guide.”**

For information about the **status of a submitted application**, see Part III., section 6. of the NIFA Grants.gov Application Guide.

### **2. Multiple Submissions**

Duplicate, essentially duplicate or predominantly overlapping applications submitted to one or more program areas within the AFRI (including FASE Grants) in any one fiscal year will not be reviewed. In addition, applicants may not submit to AFRI an application that is considered duplicate, essentially duplicate, or predominantly overlapping with an application submitted to another NIFA program in the same fiscal year.

## **PART V – APPLICATION REVIEW REQUIREMENTS**

### **A. General**

Each application will be evaluated in a two-part process. First, each application will be screened to ensure that it meets the administrative requirements as set forth in this RFA. Applications that do not fall within the guidelines, as stated in the RFA, will be eliminated from program competition and will not be reviewed. Second, applications that meet these requirements will be technically evaluated by a review panel. In addition to the review panel, written comments will be solicited from *ad hoc* reviewers when necessary. Prior to recommending an application for funding, the peer review panel and *ad hoc* reviewer comments will be presented and discussed.

Reviewers will be selected based upon their training and experience in relevant scientific, extension, or education fields, taking into account the following factors: (a) the level of relevant formal scientific, technical education, or extension experience of the individual, as well as the extent to which an individual is engaged in relevant research, education, or extension projects; (b) the need to include experts from various areas of specialization within relevant scientific, education, or extension fields; (c) the need to include other experts (e.g., producers, range or forest managers/operators, and consumers) who can assess relevance of the applications to targeted audiences and to program needs; (d) the need to include experts from a variety of organizational types (e.g., colleges, universities, industry, state and Federal agencies, private profit, and non-profit organizations) and geographic locations; (e) the need to maintain a balanced composition of reviewers with regard to minority and female representation and an equitable distribution of professional rank; and (f) the need to include reviewers who can judge the effective usefulness to producers and the general public of each application.

### **B. Evaluation Criteria**

Projects supported under this program shall be designed, among other things, to accomplish one or more of the purposes of agriculture research, education, and extension, subject to the varying conditions and needs of States. Therefore, in carrying out its review, the peer review panel will take into account the following factors.

#### **1. Research Project Applications**

These evaluation criteria will be used for the review of all single-function Research Project applications.

##### **a. Scientific Merit of the Application for Research**

- 1) Novelty, innovation, uniqueness, and originality;
- 2) Where model systems are used, ability to transfer knowledge gained from these systems to organisms of importance to U.S. agriculture;
- 3) Conceptual adequacy of the research and suitability of the hypothesis, as applicable;
- 4) Clarity and delineation of objectives;
- 5) Adequacy of the description of the undertaking and suitability and feasibility of methodology;
- 6) Demonstration of feasibility through preliminary data; and
- 7) Probability of success of the project is appropriate given the level of scientific originality, and risk-reward balance.

##### **b. Qualifications of Project Personnel, Adequacy of Facilities, and Project Management**

- 1) Qualifications of applicant (individual or team) to conduct the proposed project, including performance record and potential for future accomplishments;
- 2) Demonstrated awareness of previous and alternative approaches to the problem identified in the application;
- 3) Institutional experience and competence in subject area;
- 4) Adequacy of available or obtainable support personnel, facilities, and instrumentation; and
- 5) Planning and administration of the proposed project, including: time allocated for systematic attainment of objectives; and planned administration of the proposed project and its

maintenance, partnerships, collaborative efforts, and the planned dissemination of information for multi-institutional projects over the duration of the project.

**c. Project Relevance**

- 1) Documentation that the research is directed toward specific Program Area Priority identified in this RFA and is designed to accelerate progress toward the productivity and economic, environmental, and social sustainability of U.S. agriculture with respect to natural resources and the environment, human health and well-being, and communities.

**2. Integrated Project Applications**

These evaluation criteria will be used for the review of all multi-function Integrated Project applications.

**a. Merit of the Application for Science Research, Education, and/or Extension**

- 1) Project objectives and outcomes are clearly described, adequate, and appropriate. All project components (i.e., research, education, extension) – at least two are required – are reflected in one or more project objectives;
- 2) Proposed approach, procedures, or methodologies are innovative, original, clearly described, suitable, and feasible;
- 3) Expected results or outcomes are clearly stated, measurable, and achievable within the allotted time frame;
- 4) Proposed research fills knowledge gaps that are critical to the development of practices and programs to address the stated problem or issue;
- 5) Proposed extension leads to measurable, documented changes in learning, actions, or conditions in an identified audience or stakeholder group; and
- 6) Proposed education (teaching) has an impact upon and advances the quality of food and agricultural sciences by strengthening institutional capacities and curricula to meet clearly delineated needs and train the next generation of scientists and educators.

**b. Qualifications of Project Personnel, Adequacy of Facilities, and Project Management**

- 1) Roles of key personnel are clearly defined;
- 2) Key personnel have sufficient expertise to complete the proposed project, and where appropriate, partnerships with other disciplines (e.g., social science or economics) and institutions are established;
- 3) Evidence of institutional capacity and competence in the proposed area of work is provided;
- 4) Support personnel, facilities, and instrumentation are sufficient;
- 5) A clear plan is articulated for project management, including time allocated for attainment of objectives and delivery of products, maintenance of partnerships and collaborations, and a strategy to enhance communication, data sharing, and reporting among members of the project team; and
- 6) The budget clearly allocates sufficient resources to carry out a set of research, education (teaching), and/or extension activities that will lead to desired outcomes, with no more than two-thirds of the budget focused on a single project component. Supporting funds for Community of Practice core functions and project-specific activities are included for partnerships with eXtension.

**c. Project Relevance**

- 1) Documentation that the project is directed toward specific Program Area Priority identified in this RFA and is designed to accelerate progress toward the productivity and economic, environmental, and social sustainability of U.S. agriculture with respect to natural resources and the environment, human health and well-being, and communities;
- 2) Project components (research, education, and/or extension) – at least two are required – are fully integrated and necessary to address the problem or issue;
- 3) The proposed work addresses identified stakeholder needs;
- 4) Stakeholder involvement in project development, implementation, and evaluation is demonstrated, where appropriate;

- 5) Plan and methods for evaluating success of project activities and documenting potential impact against measurable short and mid-term outcomes are suitable and feasible;
- 6) For extension or education (teaching) activities, curricula and related products will sustain education or extension functions beyond the life of the project; and
- 7) For extension or education (teaching) activities, the resulting curricula or products share information and recommendations based on knowledge and conclusions from a broad range of research initiatives.

### **3. Conference Grant Applications**

- a. Relevance of the proposed conference to agriculture and food systems in the U.S. and appropriateness of the conference in fostering scientific exchange;
- b. Qualifications of the organizing committee and appropriateness of invited speakers to topic areas being covered; and
- c. Uniqueness, timeliness of the conference, and appropriateness of budget requests.

### **4. New Investigator and Strengthening Standard Grant Applications**

Refer to the review criteria listed above for the applicable Project Type (Research or Integrated) to which you are applying.

### **5. Sabbatical Grant, Equipment Grant, and Seed Grant Applications**

- a. The merit of the proposed activities or equipment as a means of enhancing the capabilities and competitiveness of the applicant and/or institution;
- b. The applicant's previous experience and background along with the appropriateness of the proposed activities or equipment for the goals proposed; and
- c. Relevance of the project to long-range improvements in and sustainability of U.S. agriculture, the environment, human health and well-being, and rural communities.

## **C. Conflicts of Interest and Confidentiality**

During the peer evaluation process, extreme care will be taken to prevent any actual or perceived conflicts of interest that may impact review or evaluation. For the purpose of determining conflicts of interest, the academic and administrative autonomy of an institution shall be determined by reference to the current Higher Education Directory, published by Higher Education Publications, Inc., 1801 Robert Fulton Drive, Suite 340, Reston, Virginia 20191. Phone: (888) 349-7715. Web site: [www.hepinc.com](http://www.hepinc.com).

Names of submitting institutions and individuals, as well as application content and peer evaluations, will be kept confidential, except to those involved in the review process, to the extent permitted by law. In addition, the identities of peer reviewers will remain confidential throughout the entire review process. Therefore, the names of the reviewers will not be released to applicants.

## **D. Organizational Management Information**

Specific management information relating to an applicant shall be submitted on a one-time basis as part of the responsibility determination prior to the award of a grant identified under this RFA, if such information has not been provided previously under this or another NIFA program. NIFA will provide copies of forms recommended for use in fulfilling these requirements as part of the pre-award process. Although an applicant may be eligible based on its status as one of these entities, there are factors that may exclude an applicant from receiving Federal financial and nonfinancial assistance and benefits under this program (e.g., debarment or suspension of an individual involved or a determination that an applicant is not responsible based on submitted organizational management information).

## **PART VI – AWARD ADMINISTRATION**

### **A. General**

Within the limit of funds available for such purpose, the awarding official of NIFA shall make grants to those responsible, eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. The date specified by the awarding official of NIFA as the effective date of the grant shall be no later than September 30 of the Federal fiscal year in which the project is approved for support and funds are appropriated for such purpose, unless otherwise permitted by law. It should be noted that the project need not be initiated on the grant effective date, but as soon thereafter as practical so that project goals may be attained within the funded project period. All funds granted by NIFA under this RFA shall be expended solely for the purpose for which the funds are granted in accordance with the approved application and budget, the regulations, the terms and conditions of the award, the applicable Federal cost principles, the Department's assistance regulations (parts 3015 and 3019 of 7 CFR), and the NIFA General Awards Administration Provisions at 7 CFR part 3430, subparts A through E.

### **B. Award Notice**

The award document will provide pertinent instructions and information including, at a minimum, the following:

1. Legal name and address of performing organization or institution to whom the Director has issued an award under the terms of this RFA;
2. Title of project;
3. Name(s) and institution(s) of PDs chosen to direct and control approved projects;
4. Identifying award number assigned by the Department;
5. Award type, specifying whether the grant is a standard or continuation award;
6. Project period, specifying the amount of time the Department intends to support the project without requiring re-competition for funds, and that no-cost extensions of time beyond the five year performance period will be granted only in extenuating circumstances, require prior approval and will be contingent on a satisfactory merit review conducted by NIFA;
7. Total amount of Departmental financial assistance approved by the Director during the project period;
8. Legal authority(ies) under which the award is issued;
9. Appropriate Catalog of Federal Domestic Assistance (CFDA) number;
10. Applicable award terms and conditions (see [www.nifa.usda.gov/business/awards/awardterms.html](http://www.nifa.usda.gov/business/awards/awardterms.html) to view NIFA award terms and conditions);
11. Approved budget plan for categorizing allocable project funds to accomplish the stated purpose of the award; and
12. Other information or provisions deemed necessary by NIFA to carry out its respective awarding activities or to accomplish the purpose of a particular award.

### **C. Administrative and National Policy Requirements**

Several Federal statutes and regulations apply to grant applications considered for review and to project grants awarded under this program. These include, but are not limited to:

2 CFR Part 215 – Uniform Administrative Requirements for Grants and Agreements With Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations (OMB Circular A-110).

2 CFR Part 220 – Cost Principles for Educational Institutions (OMB Circular A-21).

2 CFR Part 225 – Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A-87).

2 CFR Part 230 – Cost Principles for Non-Profit Organizations (OMB Circular A-122).

7 CFR Part 1, subpart A – USDA implementation of the Freedom of Information Act.

7 CFR Part 3 – USDA implementation of OMB Circular No. A-129 regarding debt collection.

7 CFR Part 15, subpart A – USDA implementation of Title VI of the Civil Rights Act of 1964, as amended.

7 CFR Part 331 and 9 CFR Part 121 – USDA implementation of the Agricultural Bioterrorism Protection Act of 2002.

7 CFR Part 3015 – USDA Uniform Federal Assistance Regulations, implementing OMB directives (i.e., OMB Circular Nos. A-21 and A-122, now codified at 2 CFR Parts 220 and 230) and incorporating provisions of 31 U.S.C. 6301-6308 (formerly the Federal Grant and Cooperative Agreement Act of 1977, Pub. L. No. 95-224), as well as general policy requirements applicable to recipients of Departmental financial assistance.

7 CFR Part 3017 – USDA implementation of Governmentwide Debarment and Suspension (Nonprocurement) and 7 CFR Part 3021—Governmentwide Requirements for Drug Free Workplace (Grants).

7 CFR Part 3018 – USDA implementation of Restrictions on Lobbying. Imposes prohibitions and requirements for disclosure and certification related to lobbying on recipients of Federal contracts, grants, cooperative agreements, and loans.

7 CFR Part 3019 – USDA implementation of OMB Circular A-110, Uniform Administrative Requirements for Grants and Other Agreements With Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations.

7 CFR Part 3021 – Governmentwide Requirements for Drug Free Workplace (Grants)

7 CFR Part 3022 —Research Institutions Conducting USDA-Funded Extramural Research; Research Misconduct.

7 CFR Part 3052 – USDA implementation of OMB Circular No. A-133, Audits of States, Local Governments, and Nonprofit Organizations.

7 CFR Part 3407 – NIFA procedures to implement the National Environmental Policy Act of 1969, as amended.

7 CFR Part 3430 – NIFA Competitive and Noncompetitive Nonformula Grant Programs—General Grant Administrative Provisions.

29 U.S.C. 794 (section 504, Rehabilitation Act of 1973) and 7 CFR Part 15b (USDA implementation of statute) – prohibiting discrimination based upon physical or mental handicap in Federally assisted programs.

35 U.S.C. 200 et seq. – Bayh Dole Act, controlling allocation of rights to inventions made by employees of small business firms and domestic nonprofit organizations, including universities, in Federally assisted programs (implementing regulations are contained in 37 CFR Part 401).

#### **D. Expected Program Outputs and Reporting Requirements**

Grantees are to submit initial project information and annual summary reports to NIFA's electronic, Web-based inventory system that facilitates both grantee submissions of project outcomes and public access to information on Federally-funded projects. The details of these reporting requirements are included in the award terms and conditions.



If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings (excluding Conference, Sabbatical, and Equipment Grant applications). Seed Grant applications are required to attend beginning in the second year of funding. Reasonable travel expenses should be included as part of the project budget.

## PART VII – AGENCY CONTACTS

For general questions related to the AFRI Programs, applicants and other interested parties are encouraged to contact:

AFRI Program Office:

Dr. Franklin E. Boteler, Assistant Director, Institute of Bioenergy, Climate, and Environment

Dr. Robert E. Holland, Assistant Director, Institute of Food Safety and Nutrition

Dr. Muquarrab Qureshi, Assistant Director, Institute of Youth, Family, and Community

Dr. Deborah Sheely, Assistant Director, Institute of Food Production and Sustainability

Telephone: (202) 401-5022

Fax: (202) 401-6488

E-mail: [AFRI@nifa.usda.gov](mailto:AFRI@nifa.usda.gov)

Specific questions pertaining to technical matters may be directed to the appropriate Program Area Contacts:

Program Area	Program Area Contact:
Plant Health and Production and Plant Products	Dr. Michael Bowers (202) 401-4510; <a href="mailto:mbowers@nifa.usda.gov">mbowers@nifa.usda.gov</a> Dr. Ed Kaleikau (202) 401-1931; <a href="mailto:ekaleikau@nifa.usda.gov">ekaleikau@nifa.usda.gov</a> Dr. Shing Kwok (202) 401-6060; <a href="mailto:skwok@nifa.usda.gov">skwok@nifa.usda.gov</a> Dr. Ann Lichens-Park (202) 401-6460; <a href="mailto:apark@nifa.usda.gov">apark@nifa.usda.gov</a> Dr. Liang-Shiou Lin (202) 401-5045; <a href="mailto:llin@nifa.usda.gov">llin@nifa.usda.gov</a> Dr. Mary Purcell-Miramontes (202) 401-5168; <a href="mailto:mpurcell@nifa.usda.gov">mpurcell@nifa.usda.gov</a>
Animal Health and Production and Animal Products	Dr. Margo Holland (202) 401-5044; <a href="mailto:mholland@nifa.usda.gov">mholland@nifa.usda.gov</a> Dr. Peter Johnson (202) 401-1896; <a href="mailto:pjohnson@nifa.usda.gov">pjohnson@nifa.usda.gov</a> Dr. Mark Mirando (202) 401-4336; <a href="mailto:mmirando@nifa.usda.gov">mmirando@nifa.usda.gov</a> Dr. Lakshmi Kumar Matukumalli (202) 401-1766; <a href="mailto:lmatumalli@nifa.usda.gov">lmatumalli@nifa.usda.gov</a> Dr. Steven Smith (202) 401-6134; <a href="mailto:sismith@nifa.usda.gov">sismith@nifa.usda.gov</a> Dr. Adele Turzillo (202) 401-6158; <a href="mailto:aturzillo@nifa.usda.gov">aturzillo@nifa.usda.gov</a>
Food Safety, Nutrition, and Health	Dr. Ram Rao (202) 401-6010; <a href="mailto:r Rao@nifa.usda.gov">rrao@nifa.usda.gov</a> Dr. Jeanette Thurston (202) 720-7166; <a href="mailto:jthurston@nifa.usda.gov">jthurston@nifa.usda.gov</a> Dr. Deirdra Chester (202) 401-5178; <a href="mailto:dnc Chester@nifa.usda.gov">dnc Chester@nifa.usda.gov</a> Dr. Jodi Williams (202) 720-6145, <a href="mailto:jwilliams@nifa.usda.gov">jwilliams@nifa.usda.gov</a>
Renewable Energy, Natural Resources, and Environment	Dr. Nancy Cavallaro (202) 401-5176; <a href="mailto:ncavallaro@nifa.usda.gov">ncavallaro@nifa.usda.gov</a> Dr. James Dobrowolski (202) 401-5016; <a href="mailto:jdobrowolski@nifa.usda.gov">jdobrowolski@nifa.usda.gov</a> Dr. Diana Jerkins (202) 401-6996; <a href="mailto:djerkins@nifa.usda.gov">djerkins@nifa.usda.gov</a>
Agriculture Systems and Technology	Dr. Hongda Chen (202) 401-6497; <a href="mailto:hchen@nifa.usda.gov">hchen@nifa.usda.gov</a> Dr. Richard Hegg (202) 401-6550; <a href="mailto:rhegg@nifa.usda.gov">rhegg@nifa.usda.gov</a> Dr. Daniel Schmoldt (202) 720-4807; <a href="mailto:dschmoldt@nifa.usda.gov">dschmoldt@nifa.usda.gov</a>
Agriculture Economics and Rural Communities	Dr. Suresh Sureshwaran (202) 720-7536; <a href="mailto:ssureshwaran@nifa.usda.gov">ssureshwaran@nifa.usda.gov</a> Dr. Robbin Shoemaker (202) 720 - 5468; <a href="mailto:rshoemaker@nifa.usda.gov">rshoemaker@nifa.usda.gov</a>

## **PART VIII – OTHER INFORMATION**

### **A. Access to Review Information**

Copies of reviews, excluding the identity of reviewers, and a summary of the panel comments will be sent to the applicant after the review process has been completed.

### **B. Use of Funds; Changes**

#### **1. Delegation of Fiscal Responsibility**

Unless the terms and conditions of the grant state otherwise, the grantee may not, in whole or in part, delegate or transfer to another person, institution, or organization the responsibility for use or expenditure of grant funds.

#### **2. Changes in Project Plans**

**a.** The permissible changes by the grantee, PD(s), or other key project personnel in the approved project grant shall be limited to changes in methodology, techniques, or other similar aspects of the project to expedite achievement of the project's approved goals. If the grantee or the PD(s) is uncertain as to whether a change complies with this provision, the question must be referred to the Authorized Departmental Officer (ADO) for a final determination. The ADO is the signatory of the award document, not the program (Program Area Priority) contact.

**b.** Changes in approved goals or objectives shall be requested by the grantee and approved in writing by the ADO prior to effecting such changes. In no event shall requests for such changes be approved which are outside the scope of the original approved project.

**c.** Changes in approved project leadership or the replacement or reassignment of other key project personnel shall be requested by the grantee and approved in writing by the ADO prior to effecting such changes.

**d.** Transfers of actual performance of the substantive programmatic work in whole or in part and provisions for payment of funds, whether or not Federal funds are involved, shall be requested by the grantee and approved in writing by the ADO prior to effecting such transfers, unless prescribed otherwise in the terms and conditions of the grant award.

**e.** Awards will normally not be considered for additional funding beyond that approved in an original award. No-cost extensions beyond five years will be granted only under extenuating circumstances, will require prior approval of the Authorized Departmental Officer (ADO), and will be contingent on a satisfactory merit review conducted by NIFA. Standard and Coordinated Agricultural Project (CAP) Grants (including New Investigator and Strengthening eligible grants) may be allowed for a competitive renewal. Renewal applications require full competition with other applications and will be considered provided that 1) performance has been satisfactory, 2) appropriations are available for this purpose, and 3) continued support would be in the best interest of the Federal government and the public.

**f.** Changes in an approved budget: Unless stated otherwise in the terms and conditions of award, changes in an approved budget must be requested by the grantee and approved in writing by the ADO prior to instituting such changes if the revision will involve transfers or expenditures of amounts requiring prior approval as set forth in the applicable Federal cost principles, Departmental regulations, or grant award.

### **C. Confidential Aspects of Applications and Awards**

When an application results in a grant, it becomes a part of the record of NIFA transactions, available to the public upon specific request. Information that the Secretary determines to be of a confidential, privileged, or proprietary nature will be held in confidence to the extent permitted by law. Therefore, any

information that the applicant wishes to have considered as confidential, privileged, or proprietary should be clearly marked within the application. Such an application will be released only with the consent of the applicant or to the extent required by law. The original electronic application that does not result in a grant will be retained by the Agency for a period of three years. An application may be withdrawn at any time prior to the final action thereon.

#### **D. Regulatory Information**

For the reasons set forth in the final Rule-related Notice to 7 CFR Part 3015, subpart V (48 FR 29114, June 24, 1983), this program is excluded from the scope of the Executive Order 12372 which requires intergovernmental consultation with State and local officials. Under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 35), the collections of information requirements contained in this Notice have been approved under OMB Document No. 0524-0039.

#### **E. Application Disposition**

When each peer review panel has completed its deliberations, the responsible program staff of AFRI will recommend that the project: (a) be approved for support from currently available funds or (b) be declined due to insufficient funds or unfavorable review.

AFRI reserves the right to negotiate with the PD and/or with the submitting organization or institution regarding project revisions (e.g., reductions in the scope of work, funding level, period, or method of support) prior to recommending any project for funding.

An application may be withdrawn at any time before a final funding decision is made regarding the application; however, withdrawn applications normally will not be returned. One copy of each application that is not selected for funding, including those that are withdrawn, will be retained by AFRI for a period of three years.

#### **F. Materials Available on the Internet**

AFRI program information will be made available on the NIFA Web site: [www.nifa.usda.gov/funding/afri/afri.html](http://www.nifa.usda.gov/funding/afri/afri.html). The following are among the materials available on the AFRI More Information Page:

1. More information about upcoming AFRI 2012 Requests for Applications
2. AFRI Abstracts of Funded Projects
3. AFRI Annual Reports

#### **G. Electronic Subscription to AFRI Announcements**

If you would like to receive notifications of all new announcements pertaining to AFRI RFA, you can register via Grants.gov at [www.grants.gov/search/subscribeAdvanced.do](http://www.grants.gov/search/subscribeAdvanced.do).

- Enter the e-mail address at which you would like to receive the announcements
- Enter "10.310" for *CFDA Number*
- Select "Subscribe to Mailing List"

Other criteria may be selected; however, your e-mail address and the CFDA number are the only data required to receive AFRI announcements. You do not need to be a registered user of Grants.gov to use this service. You may modify your subscriptions or unsubscribe at any time.

## H. Definitions

Please refer to [7 CFR 3430, Competitive and Noncompetitive Non-formula Grant Programs--General Grant Administrative Provisions](#) for the applicable definitions for this NIFA Grant Program

For the purpose of this program, the following additional definitions are applicable:

Director means the Director of the National Institute of Food and Agriculture (NIFA) and any other officer or employee of NIFA to whom the authority involved is delegated.

Food and Agricultural Science Enhancement (FASE) Grants mean funding awarded to eligible applicants to strengthen science capabilities of Project Directors, to help institutions develop competitive scientific programs, and to attract new scientists into careers in high-priority areas of National need in agriculture, food, and environmental sciences. FASE awards may apply to any of the three agricultural knowledge components (i.e., research, education, and extension). FASE awards include Pre- and Postdoctoral Fellowships, New Investigator grants, and Strengthening grants.

Integrated project means a project incorporating two or three functions of the agricultural knowledge system (research, education, and extension) around a problem or activity.

Limited institutional success means institutions that are not among the most successful universities and colleges for receiving Federal funds for science and engineering research. A list of successful institutions will be provided in the RFA.

Minority-serving institution means an accredited academic institution whose enrollment of a single minority or a combination of minorities exceeds fifty percent of the total enrollment, including graduate and undergraduate and full- and part-time students. An institution in this instance is an organization that is independently accredited as determined by reference to the current version of the Higher Education Directory, published by Higher Education Publications, Inc., 6400 Arlington Boulevard, Suite 648, Falls Church, Virginia 22042.

Minority means Alaskan Native, American Indian, Asian-American, African-American, Hispanic American, Native Hawaiian, or Pacific Islander. The Secretary will determine on a case-by-case basis whether additional groups qualify under this definition, either at the Secretary's initiative, or in response to a written request with supporting explanation.

Multidisciplinary project means a project on which investigators from two or more disciplines collaborate to address a common problem. These collaborations, where appropriate, may integrate the biological, physical, chemical, or social sciences.

Small and mid-sized institutions are academic institutions with a current total enrollment of 17,500 or less including graduate and undergraduate and full- and part-time students. An institution, in this instance, is an organization that possesses a significant degree of autonomy. Significant degree of autonomy is defined by being independently accredited as determined by reference to the current version of the *Higher Education Directory*, published by Higher Education Publications, Inc., 6400 Arlington Boulevard, Suite 648, Falls Church, Virginia 22042 (703-532-2300).

Strengthening Grants mean funds awarded to institutions eligible for FASE Grants to enhance institutional capacity, with the goal of leading to future funding in the project area, as well as strengthening the competitiveness of the investigator's research, education, and/or extension activities. Strengthening grants consist of Standard and Coordinated Agricultural Project Grant types as well as Seed Grants, Equipment Grants, and Sabbatical Grants.

USDA EPSCoR States (Experimental Program for Stimulating Competitive Research) means States which have been less successful in receiving funding from AFRI, having a funding level no higher than the 38th percentile of all States based on a 3-year average of AFRI funding levels, excluding FASE

Strengthening funds granted to state agricultural experiment stations and degree-granting institutions in EPSCoR States and small, mid-sized, and minority-serving degree-granting institutions. The most recent list of USDA EPSCoR States is provided in this RFA.

**TABLE 1. Most Successful Universities and Colleges Receiving Federal Funds\* .**

Use to Determine Eligibility for Strengthening Grants

Arizona State University (all campuses)	Pennsylvania State University (all campuses)	University of Massachusetts, Amherst
Baylor College of Medicine	Princeton University	University of Massachusetts, Worcester
Boston University	Purdue University (all campuses)	University of Miami
Brown University	Rutgers, The State University of New Jersey (all campuses)	University of Michigan (all campuses)
California Institute of Technology	Scripps Research Institute, The	University of Minnesota (all campuses)
Carnegie Mellon University	Stanford University	University of Missouri, Columbia
Case Western Reserve University	State University of New York, Stony Brook (all campuses)	University of New Mexico (all campuses)
Colorado State University	Texas A&M University (all campuses)	University of North Carolina, Chapel Hill
Columbia University	University of Alabama, Birmingham	University of Medicine and Dentistry New Jersey
Cornell University (all campuses)	University of Arizona	University of Pennsylvania
Dartmouth College	University of California, Berkeley	University of Pittsburgh (all campuses)
Duke University	University of California, Davis	University of Rochester
Emory University	University of California, Irvine	University of South Florida
Florida State University	University of California, Los Angeles	University of Southern California
George Washington University	University of California, San Diego	University of Texas (all campuses)
Georgetown University	University of California, San Francisco	University of Texas, Austin
Georgia Institute of Technology (all campuses)	University of California, Santa Barbara	University of Texas Health Science Center, Houston
Harvard University	University of Chicago	University of Texas Health Science Center, San Antonio
Indiana University Purdue University Indianapolis	University of Cincinnati (all campuses)	University of Texas M.D. Anderson Cancer Center
Iowa State University	University of Colorado (all campuses)	University of Texas Medical Branch
Johns Hopkins University, The	University Corporation for Atmospheric Research	University of Texas Southwestern Medical Center, Dallas
Louisiana State University (all campuses)	University of Connecticut (all campuses)	University of Utah
Massachusetts Institute of Technology	University of Delaware	University of Virginia (main campus)
Medical College of Wisconsin	University of Florida	University of Washington
Medical University of South Carolina	University of Georgia	University of Wisconsin, Madison
Michigan State University	University of Hawaii, Manoa	Vanderbilt University
Mississippi State University	University of Illinois, Chicago	Virginia Commonwealth University
Mount Sinai School of Medicine	University of Illinois, Urbana-Champaign	Virginia Polytechnic Institute and State University
New York University	University of Iowa	Wake Forest University
North Carolina State University	University of Kansas (all campuses)	Washington University, St. Louis
Northwestern University	University of Kentucky (all campuses)	Woods Hole Oceanographic Institute
Ohio State University (all campuses)	University of Maryland, Baltimore	Yale University
Oregon Health & Science University	University of Maryland, College Park	Yeshiva University
Oregon State University		

\*Data obtained from the table of Federal obligations for science and engineering research and development to the 100 universities and colleges receiving the largest amounts, ranked by total amount received in FY 2008 of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions (National Science Foundation). Campuses that are part of a larger university system as listed in Table 1 may petition for an exemption to this rule (see Part III, B. for information).



**TABLE 2. Lowest One Third of Universities and Colleges Receiving Federal Funds\* .**

Use to Determine Eligibility for Possible Waiver of Matching Funds Requirement for Equipment Grants

A. T. Still University of Health Sciences	Greenfield Community College	Radford University
Abilene Christian University	Greenville Technical College	Randolph-Macon College
Adelphi University	Grinnell College	Regis University
Agnes Scott College	Hamline University	Rhode Island College
Aiken Technical College	Hampshire College	Rider University
AK Pacific University	Harford Community College	Roanoke College
Albion College	Harris-Stowe State University	Robert Morris University
Albright College	Hawaii Pacific University	Robeson Community College
Allegheny College	Heidelberg College	Rollins College
Alma College	High Point University	Rust College
American Indian Higher Ed. Consortium	Hinds Community College (Raymond, MS)	Saginaw Valley State University
American University	Hiram College	Salem State College
American University Puerto Rico	Hood College	Salisbury University
Andrews University	Howard Community College	San Diego Mesa College
Angelo State University	Hudson Valley Community College	Sarah Lawrence College
Anna Maria College	Huston-Tillotson University	Savannah State University
Arapahoe Community College	Illinois College of Optometry	Savannah Technical College
Arcadia University	Illinois Wesleyan University	Scripps College
Arizona Western College	Indiana University-Purdue University Ft. Wayne	Seattle Community College (all campuses)
Arkansas Tech University	Indiana Wesleyan University	Seattle University
Armstrong Atlantic State University	Institute of American Indian and Alaska Native Culture and Arts Development	Seminole State College
Art Center College of Design	Iona College	Shawnee State University
Ashland University	Iowa Lakes Community College	Simmons College
Assumption College	Ithaca College	Skagit Valley College
Augsburg College	Ivy Tech Community College Indiana (all campuses)	Slippery Rock University Pennsylvania
Augustana College (Rock Island, IL)	J. F. Drake State Technical College	Sojourner-Douglass College
Augustana College (Sioux Falls, SD)	Jamestown Community College	Sonoma State University
Austin Community College	Jarvis Christian College	South Florida Community College
Austin Peay State University	John Carroll University	South Texas College
Avila University	Johnson County Community College	Southeast Missouri State University
Baker University	Kalamazoo College	Southeastern Oklahoma State University
Baltimore City Community College	Kankakee Community College	Southern New Hampshire University
Bard College at Simon's Rock	Kansas City University of Medicine and Biosciences	Southern Oregon University
Baton Rouge Community College	Keene State College	Southern Polytechnic State University
Bay Mills Community College	Kenyon College	Southwest FL College
Bellevue Community College	Kettering University	Southwestern College (Chula Vista, CA)
Belmont University	Keweenaw Bay Ojibwa Community College	Southwestern Oklahoma State University
Beloit College	King College	Southwestern University
Benedictine University	Kutztown University Pennsylvania	Springfield College (Springfield, MA)
Benjamin Franklin Institute of Technology	LA Technical College Florida Parishes Campus	St. Augustine's College
Berea College	Lake City Community College	St. Catharine College
Bethel University (all campuses)	Lake Forest College	St. Lawrence University
Bethune-Cookman University	Lake Superior State University	St. Mary's University (San Antonio, TX)
Birmingham-Southern College	Lansing Community College	St. Michael's College
Bismarck State College	Laramie County Community College	St. Norbert College
Black Hawk College (all campuses)	Lasell College	St. Peter's College
Black Hills State University	Lawrence University	St. Vincent College
Bloomsburg University Pennsylvania	Lawson State Community College	St. Xavier University
Bridgewater State College	Lebanon Valley College	State Ctr. Community College District
Brookdale Community College	LeTourneau University	State University System Florida (all campuses)
Butler University	Liberty University	Stevenson University
Butte College	Little Priest Tribal College	Stillman College
Cabrini College	Longwood University	Stonehill College
California Lutheran University	Loyola College	SUNY College Brockport
California State University, Bakersfield	Loyola University New Orleans	SUNY College Cortland
Cameron University	Lyndon State College	SUNY College Geneseo
Canisius College	Lyon College	SUNY College of Agriculture and Technology Morrisville
Carl Albert State College	Macalester College	SUNY College Oneonta
Carlos Albizu University (San Juan, PR)	Macomb Community College	SUNY College Potsdam
Carthage College	Madison Area Technical College	SUNY Empire State College
Casper College	Mansfield University Pennsylvania	SUNY Farmingdale
Central College	Marian College Fond du Lac	SUNY Fredonia
Central FL Community College	Marion Military Institute	SUNY Institute of Technology Utica-Rome
Central Georgia Technical College	Martin University	SUNY Purchase College
Central MO State University	Mary Baldwin College	Sweet Briar College
Centre College	Marymount University	Tacoma Community College
Charleston Southern University	Massachusetts Bay Community College	Tarleton State University

Chatham College	Massachusetts College of Liberal Arts	Taylor University
Christian Brothers University	McKendree University	Texas College
Clarion University Pennsylvania (all campuses)	McNeese State University	Texas Wesleyan University
Clark College	Mercyhurst College	Touro College
Cleveland State Community College	Mesa State College	Tri-College University
College Idaho	Mesabi Range Community and Technical College	Troy University main campus
College New Jersey, The	Metropolitan State College Denver	Truman State University
College of Notre Dame Maryland	Middlesex Community College	University Alaska Southeast
College of St. Catherine	Mid-South Community College	University Arkansas Ft. Smith
College of St. Rose	Midwestern University (Chicago, IL)	University Central Oklahoma
College of St. Scholastica	Millersville University Pennsylvania	University Consortium for Geographic Information Science
College of the Atlantic	Milwaukee School of Engineering	University Houston Clear Lake
College Southern Maryland	Minnesota State College Southeast Technical College	University Illinois Springfield
College Wooster	Misericordia University	University Louisiana Monroe
Colorado College	Monroe Community College	University Maine Augusta
Columbus State University	Mountain State University	University Maine Machias
Community College Rhode Island	MT Tech College of Technology	University Maryland University College
Community-Technical Colleges	Mt. Hood Community College	University New Haven
Concordia Theological Seminary	Mt. St. Mary's University	University Portland
Concordia University (River Forest, IL)	Mt. Wachusett Community College	University Puget Sound
Cooper Union	Muskingum College	University Redlands
Covenant College	National University of Health Sciences	University Sagrado Corazon
CUNY Borough of Manhattan Community College	National-Louis University	University South Dakota (all campuses)
CUNY Medgar Evers College	Naval Postgraduate School	University Tampa
CUNY New York City College of Technology	Neumann College	University Turabo
Daemen College	New Jersey School of Osteopathic Medicine	University West Florida
Daytona Beach Community College	New Mexico Military Institute	University WI-Green Bay
Defense Acquisition University	New York Law School	University Wisconsin-Platteville
Del Mar College	NHTI, Concord's Community College	University Wisconsin-River Falls
Denison University	Nicholls State University	University Wisconsin-Stout
DePauw University	Normandale Community College	University Wisconsin-Superior
Des Moines University	North Central College	University Wisconsin-Whitewater
Dickinson State University	North Dakota State College of Science	Upper Midwest Aerospace Consortium
Dixie State College Utah	North Georgia College & State University	Ursinus College
Doane College	North Hennepin Community College	Utah Valley State College
Dominican University California	Northampton County Area Community College	Valdosta State University
Dowling College	Northern Essex Community College	Valparaiso University
Drury University	Northern WY Community College District	Vermont Technical College
East Mississippi Community College	Northwestern Health Sciences University	Virginia Military Institute
Eastern Mennonite University	Northwestern Michigan College	Virginia Union University
Eastern Oregon University	Northwestern OK State University	Wabash College
El Camino College Compton Center	Northwestern State University	Wake Technical Community College
Elizabethtown College	Norwich University	Waldorf College
Elmhurst College	Occidental College	Warren Wilson College
Elon University	Ohio Northern University	Washington and Lee University
Emporia State University	Orangeburg-Calhoun Technical College	Washington College
Erskine College	Oregon College of Oriental Medicine	Wayne State College
Everett Community College	Our Lady of the Lake University	Webb Institute
Fayetteville Technical Community College	Pace University (all campuses)	Western Connecticut State University
Finger Lakes Community College	Pacific Lutheran University	Western New England College
Fitchburg State College	Pacific University	Western State College Colorado
Flathead Valley Community College	Palau Community College	Westminster College (Salt Lake City, UT)
Florence-Darlington Technical College	Pasadena City College	Westmont College
Florida Gulf Coast University	Paul Smith's College of Arts and Sciences	Wheaton College (Norton, MA)
Fox Valley Technical College	Pearl River Community College	Wheaton College (Wheaton, IL)
Francis Marion University	Peninsula College	White Earth Tribal and Community College
Franciscan University Steubenville	Pepperdine University Malibu	Whitman College
Franklin W. Olin College of Engineering	Plymouth State University	Wiley College
Ft. Hays State University	Polk Community College	Wilkes University
Gem National Consortium for Graduate Degrees for Minorities in Engineering and Science, InCollege	Prescott College	William Paterson University New Jersey
Geophysical Institute, UAF	Prince George's Community College	Winona State University
Gonzaga University	Quinnipiac University	Wittenberg University
Gordon College (Wenham, MA)	Quinsigamond Community College	York Technical College
Goucher College		

\*Data obtained from the table of Federal obligations for science and engineering research and development to universities and colleges, ranked by total amount received, by agency from the FY 2008 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions (National Science Foundation).

**FIGURE 1. Flow Chart for Strengthening Grant Eligibility.**

