

# National Research Initiative Competitive Grants Program

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*FY 2004 Request for Applications*



**U.S. Department of Agriculture**



**Cooperative State Research, Education, and Extension Service**

**COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE; U.S.  
DEPARTMENT OF AGRICULTURE**

**NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM**

**INITIAL ANNOUNCEMENT**

**CATALOG OF FEDERAL DOMESTIC ASSISTANCE:** This program is listed in the Catalog of Federal Domestic Assistance under 10.206.

**STAKEHOLDER INPUT:** The Cooperative State Research, Education, and Extension Service (CSREES) is requesting comments regarding this request for applications (RFA) from any interested party. These comments will be considered in the development of the next RFA for the program. Such comments 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. Comments should be submitted as provided in the **DATES** portion of this announcement.

Written stakeholder comments should be submitted by mail to: Policy and Program Liaison Staff; Office of Extramural Programs; USDA-CSREES; STOP 2299; 1400 Independence Avenue, S.W.; Washington, D.C. 20250-2299; or via e-mail to: [RFP-OEP@csrees.usda.gov](mailto:RFP-OEP@csrees.usda.gov). (This e-mail address is intended only for receiving comments regarding this RFA and not requesting information or forms.) In your comments, please state that you are responding to the National Research Initiative RFA.

**DATES:** All applications must be received by close of business (COB) (5:00 p.m. Eastern Time) on the dates indicated at the end of this announcement. Applications received after applicable deadlines will not be considered for funding. Comments regarding this RFA are requested within six months from the issuance of this notice. Comments received after that date will be considered to the extent practicable.

**EXECUTIVE SUMMARY:** CSREES requests applications for the National Research Initiative (NRI) Competitive Grants Program for fiscal year (FY) 2004 to support (1) high priority fundamental and mission-linked research of importance in the biological, environmental, physical, and social sciences relevant to agriculture, food, and the environment and (2) competitively awarded research, extension, and education grants addressing key issues of national and regional importance to agriculture, forestry, and related topics. In FY 2004, CSREES anticipates that approximately \$120 to \$150 million will be available for support of this program. Of this amount, no more than 20% will be made available to fund integrated projects (see Part I, A.). The remaining funds will be used to fund research projects.

This notice identifies program objectives for research projects and integrated projects. It describes separate eligibility criteria and matching requirements for each type of project, and instructs applicants regarding the submission and review of applications. CSREES additionally requests stakeholder input from any interested party for use in the development of the next RFA for this program.

## **IMPORTANT INFORMATION REGARDING NRI POLICIES AND PROCEDURES:**

**\*\*\*\*\* PLEASE READ \*\*\*\*\***

### **Changes in the FY 2004 RFA**

This RFA invites applications for research grants and integrated research, extension, and education grants. Eligibility, requirements for matching funds, and types of projects are different for research grants compared to integrated research, extension, and education grants; thus, applicants are strongly encouraged to read the entire RFA and contact the appropriate National Program Leader with any questions. The NRI will use no more than 20% of available funds to support integrated research, extension, and education grants (see Part I. A.); these funds will not be distributed uniformly across all NRI programs.

### **Deadline Date Changes**

Starting with FY 2003, research application submission deadline dates were changed from "postmarked by" dates to "received by" dates. Applications must be received in the Proposal Services Unit/CSREES by 5:00 p.m., Eastern Time, on or prior to the applicable deadline date indicated in this RFA. *Note that the deadline dates have changed from what was anticipated and announced earlier.* The FY 2005 RFA will establish permanent deadlines that will change from the FY 2004 deadlines and move the NRI to four main deadlines per fiscal year.

### **Submitting Applications and Deadline Dates for Agricultural Research Enhancement Awards**

Applicants for Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, or Seed Grants, must submit their applications by the deadline date indicated for the appropriate NRI program. Place the program code for the program in Block 8 of the Proposal Cover Page (Form CSREES-2002) and check the appropriate box on the Project Summary (Form CSREES-2003).

### **Funding Limit Guidelines**

The NRI has instituted funding limit guidelines for all application types submitted to this program. Applicants should consult individual programs for the guidelines that apply to each program and are strongly encouraged to adhere to these funding limit guidelines.

### **Frequently Asked Questions**

The NRI now has a list of Frequently Asked Questions on the NRI web site (<http://www.reeusda.gov/nri>), which can be found under "NRI Information."

### **Weekend or Holiday Deadlines**

When the deadline date for a program falls on a weekend or Federal holiday, applications must be received by the normal business day immediately following the published deadline date.

### **Waiver of Matching Funds Requirement for Equipment Grants**

The requirement for matching funds may be waived if the award is to a college, university, or research foundation maintained by a college or university that ranks in the lowest  $\frac{1}{3}$  of such colleges, universities, and research foundations on the basis of Federal research funds received and if the equipment to be acquired costs not more than \$25,000 and either has multiple uses within a single research project or is useable in more than one research project.

**Current and Pending Support**

Current and pending support information (on Form CSREES-2005) is now required only for the Project Directors as listed on the Proposal Cover Page (Form CSREES-2002). In addition to completing Form CSREES-2005, Project Directors also should include either a brief statement of objectives or project summaries for all projects listed in Current and Pending Support that could be deemed through the review process as potentially overlapping with the submitted application based on project title, including formula funding and other forms of intramural support.

**Materials on the Internet**

Please see Part VIII, F. for a list of NRI materials available on the Internet and instructions on how to access that information.

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# **PART I—FUNDING OPPORTUNITY DESCRIPTION**

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

The authority to support research projects through this program is contained in 7 U.S.C. 450i(b). Under this authority, subject to the availability of funds, the Secretary may award competitive research grants, for periods not to exceed five years, for the support of research projects to further the programs of the USDA.

In FY 2003, Section 737 of the General Provisions of the Consolidated Appropriations Resolution, 2003 (Division A of Pub. L. 108-7) provided CSREES with the authority to use up to twenty percent of the amount made available in the Act for the National Research Initiative Competitive Grants Program (NRI), to carry out a competitive grants program under the same terms and conditions as those provided in Section 401 of the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) (7 U.S.C. 7621). In FY 2004, CSREES anticipates similar language; however, funding for integrated activities is contingent on the availability of appropriated funds.

Section 401 of AREERA authorizes the Secretary of Agriculture to establish a research, extension, and education competitive grants program to address critical emerging U.S. agricultural and rural issues related to future food production; environmental quality and natural resource management; farm income; or rural, economic and business and community development policy. In addition the Secretary of agriculture is authorized to make grants that address priority mission areas related to: a) agricultural genome, b) food safety, food technology and human nutrition, c) new and alternative uses and production of agricultural commodities and products, d) agricultural biotechnology, e) natural resource management, including precision agriculture, and f) farm efficiency and profitability, including the viability and competitiveness of small and medium sized dairy, livestock, crop and other commodity operations.

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

The purpose of the NRI Program is to support research, extension, and education grants that address key problems of national, regional, and multistate importance in sustaining all components of agriculture (farming, ranching, forestry including urban and agroforestry, aquaculture, rural communities, human nutrition, processing, etc.). Providing this support requires that NRI advance fundamental sciences in support of agriculture and coordinate opportunities to build on these discoveries. Building on these discoveries will necessitate new efforts in education and extension that deliver science-based knowledge to people, allowing them to make informed practical decisions. Hence, the NRI will now accept applications for fundamental research, mission-linked research, and integrated research, extension, and education projects. However, applicants should know that the NRI will use no more than 20% of available funds to support integrated projects (see Part I, A.) and that these funds will not be distributed uniformly, but targeted to specific priorities. Targeted priorities for integrated projects are clearly identified within the detailed descriptions of program offerings (see Part II, E.).

CSREES may also solicit applications for NRI funds through other announcements such as supplemental NRI RFAs or in conjunction with multiagency programs. Such announcements will be made public in the same manner as this announcement.

The NRI is administered by the Competitive Programs (CP) unit, CSREES of USDA. The purpose of the NRI is to support high priority fundamental and mission-linked research of importance in the biological, environmental, physical, and social sciences relevant to agriculture, food, and the environment. For this purpose, the following definitions apply:

- 1. Fundamental Research:** Research that tests scientific hypotheses and provides basic knowledge which allows advances in applied research and from which major conceptual breakthroughs are expected to occur.
- 2. Mission-linked Research:** Research on specifically identified agricultural problems which, through a continuum of efforts, provides information and technology that may be transferred to users and may relate to a product, practice, or process.
- 3. Multidisciplinary Projects:** Projects (research or integrated) in which investigators from two or more disciplines are collaborating closely. These collaborations, where appropriate, may integrate the biological, physical, chemical or social sciences.
- 4. Integrated Projects:** Integrated means to bring the three components of the agricultural knowledge system (research, education, and extension) together around a problem or activity. In FY 2004, the NRI is seeking to support projects that bring together at least two of these components and address identified agricultural problems as described in this RFA.

The research programs described herein were developed within the context of the authorized purposes of USDA research, extension, and education<sup>1</sup>, and within the framework of the CSREES Strategic Plan<sup>2</sup>. In addition, the NRI obtains input from Congress, the National Agricultural Research, Extension, Education, and Economics Advisory Board and a number of university, scientific, and agricultural committees and organizations.

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<sup>1</sup> 7 U.S.C. 3101

<sup>2</sup> Available at <http://www.reeusda.gov/part/gpra/stratplan.htm>

## 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. Contingent on congressional action, in FY 2004, CSREES anticipates that approximately \$150 million will be available for support of this program. Of this amount, no more than 20% will be made available to fund integrated projects (see Part I, A.). The remaining funds will be used to fund research projects.

NRI funds may be used to fund applications submitted to supplementary NRI RFAs and/or solicitations for multiagency programs in which the NRI is participating. No less than 10 percent of the funds available to support research projects will be made available for Agricultural Research Enhancement Awards (excluding New Investigator Awards), and no more than two percent will be made available for equipment grants. Further, no less than 30 percent of the funds available to support research projects shall be made available for grants for research to be conducted by multidisciplinary teams, and no less than 40 percent shall be made available for grants for mission-linked systems research.

### *B. Types of Applications*

In FY 2004, applications may be submitted to the NRI Program as one of the following four types of requests:

- 1. New application.** This is a project application that has not been previously submitted to the NRI Program. All new applications will be reviewed competitively using the selection process and evaluation criteria described in Part V—Application Review Requirements.
- 2. Renewal application.** This is a project application that requests additional funding for a project beyond the period that was approved in an original or amended award. Applications for renewed funding must contain the same information as required for new applications and additionally must contain a Progress Report (see Project Description, Part IV, B., 1., f. under Integrated and Standard Research Grant Applications). Renewal 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 as new applications.
- 3. Resubmitted application.** This is an application that had previously been submitted to the NRI Program but was not funded. Project Directors (PDs) must respond to the previous review panel summary (see Response to Previous Review, Part IV, B., 1., e. under Integrated and Standard Research Grant Applications). 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 as new applications. The revised application should clearly indicate the changes that have been made in the proposed project. 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 (new, renewal, and resubmissions) submitted to the program at the same time.
- 4. Resubmitted renewal application.** This is a project application that requests additional funding for a project beyond the period that was approved in the original or amended award and that had previously been submitted for renewal to the NRI Program but was not approved. Therefore, PDs must provide a Progress Report as required under the Project Description, Part IV, B., 1., f., (b) under Integrated and Standard Research Grant Applications), and must respond to the previous review panel summary as required under Response to Previous Review, Part IV, B., 1., e. under Integrated and Standard Research Grant Applications. Resubmitted renewal applications must be received by the relevant due dates, will be evaluated in competition with other

pending applications in the appropriate areas to which they are assigned, and will be reviewed according to the same evaluation criteria as new applications.

### ***C. Project Types***

**For applications proposing research projects, support will be provided through Standard Research Grants, Conferences, Postdoctoral Fellowships, New Investigator Awards, and Strengthening Awards.**

In FY 2004, applications are being solicited for the project types:

#### **1. Conventional Projects**

**(a) Standard Research Grants:** Research will be supported that is **fundamental** or **mission-linked**, and that is conducted by **individual** investigators, co-investigators within the same discipline, or **multidisciplinary** teams.

A new type of standard award is introduced in this RFA, the Coordinated Agricultural Project (CAP) award. CAP awards are large-scale, multi million dollar projects that are intended to promote collaboration, open communication and exchange of information, reduce duplication of effort, and coordinate activities among individuals, institutions, states, and regions. Unit participants would serve as a team that would be able to conduct targeted research in response to emerging or priority area(s) of national need. Applications are expected to articulate how a CAP will complement and/or link with existing programs or projects at the National level. A research CAP unit would contain the needed science based expertise as well as expertise from principal stakeholders and partners to accomplish project goals and objectives. Applications would outline the potential of this unit, the structure, coordination, plan of implementation and propose several research areas that will be evaluated during the study period.

In FY 2004, CSREES plans to make continuation grants for an initial project period of one year to CAP grantees who have requested funding for 2-4 years. A continuation grant is a grant instrument by which the Department agrees to support a specified level of effort for a predetermined project period with a statement of intention to provide additional support at a future date, provided that performance has been satisfactory, appropriations are available for this purpose, and continued support would be in the best interest of the Federal government and the public. If these three elements are met, CSREES plans to provide additional support in FY 2005 to fund the second year of previously funded CAP projects. CSREES will provide applicants funded in FY 2004 with further instructions about submitting applications in FY 2005.

The three NRI program areas that will accept CAP applications this year are the Food Safety CAP Program (32.2), the Applied Plant Genomics CAP Program (52.4) and the Animal Biosecurity Program (20.0). For detailed information including deadline dates for submission of applications and letters of intent, applicants should read the respective program descriptions for 32.2, 52.4, and 20.0. Each program anticipates making only one award not to exceed a total of \$5 million dollars (including indirect costs) for a period of time not to exceed 4 years.

**(b) Conferences:** Scientific meetings that bring together scientists to identify research needs, update information, or advance an area of research are recognized as integral parts of research efforts. Support for a limited number of such meetings covering subject matter encompassed by this solicitation will be considered for partial or, if modest, total support. These applications should be submitted to the appropriate program described under Part II, E., Research Opportunities. Applicants considering submission under this category are strongly advised to consult the appropriate NRI staff before preparation and submission of the application.

## 2. Agricultural Research Enhancement Awards (AREA)

To contribute to the enhancement of research capabilities in the research programs described herein, applications are solicited for Agricultural Research Enhancement Awards (AREA). These awards are designed to help institutions develop competitive research programs and to attract new scientists into careers in high-priority areas of national need in agriculture, food, and environmental sciences. The AREA program provides support for Postdoctoral Fellowships, research awards for New Investigators, and Strengthening Awards. Specific eligibility requirements for these awards are described below. Applications submitted by non-United States organizations will not be considered for support. However, United States citizens applying as individuals for Postdoctoral Fellowships may do all or part of the proposed work at a non-United States organization.

**(a) Postdoctoral Fellowships:** Individuals who have recently received or will soon receive their doctoral degree are encouraged to submit applications. **These applications may be submitted either directly by the individual or through the mentor's institution. The postdoctoral applicant must be the sole PD listed on the application.** The following requirements apply: (1) the doctoral degree must be received after January 1, 2001, and by June 15, 2004; (2) the individual must be a citizen of the United States; (3) the application must contain (A) documentation that arrangements have been made with an established investigator to serve as mentor; (B) documentation that arrangements have been made for the necessary facilities, space, and materials for conduct of the research; and (C) documentation from the host institution's authorized organizational representative (AOR) indicating that **the host institution concurs with these arrangements**; and (4) the research proposed must be solicited in and directly submitted to a program described under Part II, E., Research Opportunities, in this document. Although a proposed project may fit in the context of the mentor's existing research area, projects are specifically solicited that **initiate** the postdoctoral student's **independent** research program, rather than serve as extensions of ongoing projects in the mentor's laboratory. Postdoctoral awards are limited to a total award of \$110,000 and two years' duration and are not renewable. Funds should be requested primarily for salary support, although other expenditures (e.g., supplies, travel, and publication) are allowable costs if properly justified. An institutional allowance (not to exceed \$2,400/year) may be requested within the \$110,000 maximum award limit. **Applications should be submitted to the appropriate research program described in this solicitation by the designated deadline for that particular program. A separate peer review panel will not be assembled to review these applications.**

An institution may provide compensation for non-research services. Compensation for services is not considered stipend supplementation. However, it is expected that compensated services will occur on a limited, part-time basis apart from the normal postdoctoral research activities, which require a minimum of 40 hours per week. Under no circumstances may the conditions of stipend supplementation or the services provided for compensation interfere with, detract from, or prolong the fellow's 2-year approved NRI postdoctoral fellowship.

**Applicants are urged to contact program staff concerning questions related to eligibility, budget, and similar matters.**

**(b) New Investigator Awards:** A new investigator is one who is beginning his/her research career, does not have an extensive research publication record, and has less than five years postgraduate, career-track research experience. The new investigator may not have received competitively awarded Federal research funds beyond pre- or postdoctoral research awards. The application must contain documentation that lists all prior Federal research support. **The PD and all co-PDs must meet all of the New Investigator eligibility requirements as described within this section. Research colleagues who do not meet eligibility requirements should be designated only as collaborators and should not be listed on the Proposal Cover Page (Form CSREES-2002).** Applications may be submitted by any State agricultural experiment station, college, university, other research institution or organization, Federal agency, national laboratory, private organization, corporation, or individual. Applications submitted by non-United States organizations will not be considered for support. The research proposed shall be appropriate to a program described under Part II, E., Research Opportunities, and **the application must be submitted directly to that program by the designated deadline date.** A separate peer review panel will not be assembled to review these applications.

**(c) Strengthening Awards:** Strengthening Awards consist of Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, Seed Grants, and Strengthening Standard Research Project Awards. **The NRI particularly encourages applications for Research Career Enhancement Awards (Sabbatical Awards).** All applications submitted for Strengthening Awards, in addition to fulfilling the requirements in this part, must be appropriate to one of the research programs described under the Research Opportunities part of this RFA.

Applications are solicited that request funds for Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, Seed Grants, or Strengthening Standard Research Project Awards. Research Career Enhancement Awards, Equipment Grants, Seed Grants, and Strengthening Standard Research Project Awards will be available to ensure that (a) faculties of small and mid-sized academic institutions that are not among the most successful universities and colleges for receiving Federal funds for science and engineering research (see Table 1. at the end of this document for an alphabetical listing of the most successful institutions) and (b) PDs at institutions eligible for USDA EPSCoR (Experimental Program for Stimulating Competitive Research) funding receive a portion of the grants. When determining eligibility for these grant types, the following definitions apply:

**(1) Small and mid-sized institutions** are academic institutions with a current total enrollment of 15,000 or less including graduate and undergraduate and full- and part-time students. (Applicants applying under this category should indicate the current total enrollment of the institution in a cover letter.) An institution in this instance is an organization that possesses a significant degree of autonomy.

**(2) Limited institutional success** means institutions which are **not** among the most successful universities and colleges for receiving Federal funds for science and engineering research. See Table 1 at the end of this document for an alphabetical listing of the most successful institutions.

States eligible for **USDA-EPSCoR** funds are those States which have had a funding level from the NRI no higher than the 38th percentile of all States, based on total funding for a three year period (excluding strengthening set-aside funds). For FY 2004, the following States fall into this category:

Alabama	Hawaii	Maine	New Mexico	South Dakota
Alaska	Idaho	Mississippi	North Dakota	Vermont
Arkansas	Kentucky	Nevada	Oklahoma	West Virginia
Connecticut		New Hampshire	Rhode Island	Wyoming

Other entities eligible for **USDA-EPSCoR** funds in FY 2004 include the following United States commonwealths, territories, possessions and their successors and the District of Columbia:

American Samoa	Guam	Northern Mariana Islands	Virgin Islands of the U.S.
District of Columbia	Micronesia	Puerto Rico	

**All** applicants for Strengthening Awards must meet the criteria described herein for the type of award for which the applicant applies. **An individual applicant may submit only one strengthening application (Research Career Enhancement Awards, Equipment Grants, Seed Grants) as PD or co-PD this fiscal year.** The PD and **all** co-PDs must meet **all** Strengthening eligibility requirements as described in these guidelines.

Research Career Enhancement Awards, Equipment Grants, Seed Grants, and Strengthening Standard Research Project Award applications shall be appropriate to a program described under Part II, E., Research Opportunities, and the application must be submitted directly to that program by the designated deadline date. A separate peer review panel will not be assembled to review these applications.

**Investigators are encouraged to contact the National Program Leader of the appropriate research program described in Part II, E., Research Opportunities, regarding questions about suitability of research topics or research topics for which equipment would be used and to verify eligibility.**

**See Part IV, B., 3., c. for detailed instructions regarding what to submit for a particular type of strengthening award.**

In addition to being appropriate for and submitted to one of the research program areas described under Part II, E., Research Opportunities, applications for Strengthening Awards must fit within one of the following specified areas:

#### **Research Career Enhancement Awards (Sabbatical Awards)**

**The purpose of these awards is to provide an opportunity for faculty to enhance their research capabilities by funding sabbatical leaves.** These awards will be limited to individual faculty who have appointments at small and mid-sized degree-granting institutions that previously have had limited institutional success and to faculty who have appointments at degree-granting institutions eligible for USDA-EPSCoR funding. The proposed PD may not have served as a PD on a NRI grant within the past five years (including Seed Grants, Research Career Enhancement Awards, and Postdoctoral Fellowships but excluding Equipment Grants).

**Collaborative arrangements are encouraged; however, research colleagues who do not meet eligibility requirements may only serve as collaborators and should not be listed on the Proposal Cover Page (CSREES-2002).**

The sabbatical description must include the research interests and goals of the PD, the research project to be pursued while on sabbatical leave, an indication of how the sabbatical leave will enhance the research capabilities of the PD, and a statement of future research goals and how the sabbatical will enable the PD to pursue these goals. A letter detailing the particulars of the arrangement with the home institution (e.g., dates and duration of sabbatical and salary arrangements) and a letter of support and intent from the established investigator who will be the host are to be included in the application. The host's letter is to provide assurance that all facilities and space necessary for conduct of the research will be available. Awards will be limited to one year's salary and funds for travel and supplies. These awards are not renewable. **Use the program code for**

**the program in Box 8 of the Proposal Cover Page (Form CSREES-2002) and check the “Career Enhancement” box on the Project Summary (Form CSREES-2003).**

### **Equipment Grants**

**Funds will be designated for equipment grants to strengthen the research capacity of institutions.** Only degree-granting institutions that are not among the most successful universities and colleges for receiving Federal funds for science and engineering research may apply (Table 1).

Each request shall be limited to one major piece of equipment within the cost range of \$10,000-\$250,000. The amount requested shall not exceed 50 percent of this 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. A letter(s) from the organization(s) committed to providing the remaining non-Federal funds must be included in the application. The requirement for matching funds may be waived if the award is to a college, university, or research foundation maintained by a college or university that ranks in the lowest 1/3 of such colleges, universities, and research foundations on the basis of Federal research funds received and if the equipment to be acquired costs not more than \$25,000 and either has multiple uses within a single research project or is useable in more than one research project.

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.

A description of the research project(s) for which the equipment will be used and how the equipment will fit into or enhance the research program and allow the applicant(s) to become more competitive for future funding is required. A description of similar or complementary equipment available to the PD and why the requested equipment is necessary is also required. PDs are encouraged to 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. These awards are not intended to replace requests for equipment in individual research projects. Rather, they are intended to help fund items of equipment that will upgrade research infrastructure. Requests for computer equipment are allowed only if it is to be used in activity integral to the proposed project; use of a computer primarily as a word processor or for administrative purposes is not permitted. **Use the program code for the program in Box 8 of the Proposal Cover Page (Form CSREES-2002) and check the “Equipment” box on the Project Summary (Form CSREES-2003).**

### **Seed Grants**

**The purpose of these awards is to provide funds to enable investigators to collect preliminary data in preparation for applying for a Standard Research Grant.** These awards will be limited to faculty with appointments at small and mid-sized degree-granting institutions that have had limited institutional success and to faculty with appointments at degree-granting institutions eligible for USDA-EPSCoR funding. Proposed PDs may not have served as a PD on a NRI grant within the past five years (including Seed Grants, Research Career Enhancement Awards, and Postdoctoral Fellowships but excluding Equipment Grants). All PD *and* co-PDs must meet all eligibility requirements for the Strengthening Program. **PLEASE NOTE:** A PD or co-PD of a Seed Grant may not serve as a PD or co-PD on another Seed Grant within the five years of the initial Seed Grant. Research colleagues who do not meet eligibility requirements may only serve as collaborators and should *not* be listed on the Proposal Cover Page (Form CSREES-2002). These awards will be limited to a total of \$100,000 (including indirect costs) for two years and are **not renewable**. Applications for seed grants are expected to indicate how the research will enhance future competitiveness of the PD in applying for Standard

Research Grants. Also, awards are not intended to fund stand-alone research projects but rather projects that will lead to further research applicable to one of the research areas in the NRI.

### **Strengthening Standard Research Project Awards**

These awards will be limited to faculty with appointments at small and mid-sized degree granting institutions that have had limited institutional success and to faculty with appointments at degree granting institutions eligible for USDA-EPSCoR funding. PDs may not have served as a PD on a NRI grant (**excluding Seed Grants, Research Career Enhancement Awards, Equipment Grants, and Postdoctoral Fellowships**) within the past five years. All PD **and** co-PDs must meet all eligibility requirements for the Standard Strengthening Research Project Awards Program. Research colleagues who do not meet eligibility requirements may only serve as collaborators and should **not** be listed on the Proposal Cover Page (Form CSREES-2002).

### **Flow Chart for Strengthening Eligibility**

A flow chart for determining eligibility for Strengthening Research Awards is included as Figure 1. at the end of this document.

**The project subject for any Strengthening Award must be appropriate to a program described under Part II, E., Research Opportunities, in this document.** A separate peer review panel will not be assembled to review these applications.

### **3. Integrated Projects**

**(a) Integrated Project Grants:** Integrated project applications may involve any combination of research, education, and extension activities, with the provision that every project must include at least two of the three stated components (i.e., research, education, and extension) required for integration as defined in Part VIII, H. Integrated project applications may include, for example, institutions that conduct research; synthesize previous, ongoing and future research; develop curricula and build educational and research capacity; and transfer information to producers, end users, and the public. The type and number of participating institutions should be appropriate to the project proposed, and should include all participants necessary for successful completion of the projects. Integrated projects are expected to generate new knowledge and/or apply existing knowledge quickly through outreach and the dissemination of information on specific issues in agriculture where results may be visible over the short term.

Dependent on the merits of proposals received, CSREES will ensure that a portion of project grants will be awarded to proposals in which the lead institutions (recipient of the Federal funds) are small, mid-sized, and minority-serving institutions. When determining eligibility for these grant types, the following definitions apply:

**(1) Small and mid-sized institutions** are academic institutions with a current total enrollment of 15,000 or less including graduate and undergraduate and full- and part-time students and that are no higher than the 50<sup>th</sup> percentile of academic institutions funded by the National Research Initiative Competitive Grants Program in the past three years and are not within the top 100 Federally funded institutions (See Table 2. at the end of this document for an alphabetical listing of the most successful institutions.). (Applicants applying under this category should indicate the current total enrollment of the institution in a cover letter.) An institution in this instance is an organization that possesses a significant degree of autonomy.

**(2) Minority-serving institution** means an academic institution whose enrollment of a single minority group or a combination of minority groups (as defined in Part VIII, H.) exceeds fifty percent of the total enrollment, including graduate and undergraduate and full- and part-time students. (Applicants applying under this category should indicate the current total enrollment of the institution in a cover letter.) An institution in this instance is an organization that possesses a significant degree of autonomy.

Other institutions or organizations involved in small- and mid-sized institution eligible projects or minority-serving institution eligible projects need not meet the criteria described in the definitions for small- and mid-sized institution or minority-serving institutions.

A new type of integrated project grant is introduced in this RFA, the Coordinated Agricultural Project (CAP) award. CAP awards are large-scale, multi-million dollar projects that are intended to promote collaboration, open communication and exchange of information, reduce duplication of effort, and coordinate activities among individuals, institutions, states, and regions. Unit participants would serve as a team that would be able to conduct targeted research, extension, and education in response to emerging or priority area(s) of national need. Applications are expected to articulate how a CAP award will complement and/or link with existing programs or projects at the national level. An integrated research, extension, and education CAP unit would contain the needed science based expertise as well as expertise from principal stakeholders and partners to accomplish project goals and objectives. Applications would outline the potential of this unit, the structure, coordination, plan of implementation and propose several research, extension, and education areas that will be addressed during the study period.

In FY 2004, CSREES plans to make continuation grants for an initial project period of one year to CAP awardees who have requested funding for 2-4 years. A continuation grant is a grant instrument by which the Department agrees to support a specified level of effort for a predetermined project period with a statement of intention to provide additional support at a future date, provided that performance has been satisfactory, appropriations are available for this purpose, and continued support would be in the best interest of the Federal government and the public. If these three elements are met, CSREES plans to provide additional support in FY 2005 to fund the second year of previously funded projects. CSREES will provide applicants funded in FY 2004 with further instructions about submitting applications in FY 2005.

The three NRI program areas that will accept CAP applications this year are the Food Safety CAP Program (32.2), the Applied Plant Genomics CAP Program (52.4) and the Animal Biosecurity Program (20.0). For detailed information including deadline dates for submission of applications and letters of intent, applicants should read the respective program descriptions for 32.2, 52.4 and 20.0. Each program anticipates making only one award for an amount not to exceed \$5 million (including indirect costs) for a period of time not to exceed 4 years.

**(b) Bridge Grants:** Bridge grants are designed to assist small, mid-sized, and minority-serving institutions that have not previously been successful in obtaining competitive grants under subsection (b) of the Competitive, Special, and Facilities Research Grant Act (7 U.S.C. 450i(b)) (i.e., NRI) in order to sustain and enhance important collaborations and activities that might lead to future program success or success in obtaining other grants. A flow chart for determining eligibility for bridge grants is included as Figure 2. at the end of this document. Institutions eligible for bridge grants will be considered for a one-time infusion of up to \$100,000 if an Integrated Project Grant application is considered meritorious but ranks below the funding cutoff during the peer review process.

Applicants may not apply directly for bridge grants. Bridge grants will be awarded only to eligible small- and mid-sized institutions and minority-serving institutions (as defined under 3(a), above) which are **not** among the most successful universities and colleges for receiving Federal funds for science and engineering research. See

Table 2. at the end of this document for an alphabetical listing of the most successful institutions. Awards will be made after peer review of an integrated project grant application places the application below the funding cutoff. Applicants applying under this category should indicate whether the institution qualifies as a small, mid-sized institution or a minority-serving institution (see Part VIII, H.) along with the current total enrollment of the institution in a cover letter that accompanies their proposal.

## ***D. Agricultural Issues***

The NRI continues to support fundamental research while expanding on that foundation to address issues important to the future success of U.S. agriculture. The selection of issue areas to be addressed is a dynamic process that is designed to be responsive to changing priorities in agriculture, while ensuring that the program supports a foundation set of programs that provide the fundamental knowledge required for response to important issues as they emerge. Decisions about which issue areas to pursue are based on stakeholder input, congruence with Presidential initiatives, and two recent reports from the National Academy of Sciences' Board on Agriculture (2000 and 2002). These issues are further designed to address the purposes of section 401 of AREERA including all statutorily-identified critical emerging agricultural and rural issues, and priority mission areas (see Part I, A.). The NRI is moving to address the following six issues. Many NRI programs that address one particular issue will also intersect one or more of the other five issues. **Applicants should indicate in the Project Summary which issue(s) their proposed project addresses.**

### **1. Genomics and Future Food and Fiber Production**

Many needs and challenges face our nation's food and fiber production including development of livestock, poultry, and fish resistant to disease; development of crop varieties resistant to disease and tolerant of global change; and production of foods with improved nutritional content. Management and detection of invasive pests and diseases, increased threats to biosecurity, and bioaccumulation of toxins in the environment are also important challenges. Agricultural genomics (the characterization of the sequence, structure, and function of genes) will play a major role in providing the knowledge and technologies to face these needs and challenges. Functional genomics will enable increased disease resistance, broader growing ranges, optimized yields, better disease and pest management and detection, and improved environmental remediation and protection. It can also lead to new value-added products, such as animal-based production systems for specialized pharmaceuticals and plant-derived vaccines and industrial lubricants, and can create more choices for consumers. The combining of genomics with conventional genetic breeding approaches will allow agricultural scientists to optimize production, quality, and value, factors necessary for sustainability of our nation's food and fiber production. Application of genomics, through delivery technologies at the whole organism- and system-level including plant and animal breeding, will deliver the broad goals and benefits of genomics research not only to agriculture but also to forestry, energy, and the environment.

To make use of the opportunities that can result from agricultural genomics, research in many areas is needed, from basic research to practical applications. Generation of the fundamental knowledge needed both to complement genomics research and to apply genomics to practical problems may require multidisciplinary approaches. Broad examples of research appropriate to this Issue Area include fundamental research on cellular and organismal pathways and processes, small- and large-scale gene identification and characterization, structural genomics and genetics, and technology development and application.

### **2. Food Safety**

Food safety consistently ranks as a high priority issue for producers, processors, and consumers alike. This is reflected in the government-wide emphasis on building and maintaining a seamless food safety program across all twelve Federal agencies that share responsibility for protecting the U.S. food supply. Data from Centers for

Disease Control and Prevention indicate that there are 78 million new cases of food borne illness in the U.S. each year, resulting in 325,000 hospitalizations and 5,000 deaths. A high level of commitment by Federal, state, and local agencies to combat food borne illness has resulted in a 20 percent decrease in illness incidence over the past six years. However, the etiology of 70 percent of food borne illnesses remains elusive as new pathogens emerge, and familiar pathogens evolve to resist conventional approaches to their control and/or elimination. NRI supports innovative research on a broad range of food safety issues from farm to table. This Issue Area places a strong focus on methods development for detecting and controlling food borne pathogens, including biotechnology.

### **3. Improving Food, Nutrition, and Communities for Better Human Health**

The nutritional quality of the American diet is the connection between agriculture and human health. The Issue Area of Improving Food, Nutrition and Communities for Better Health encompasses projects that contribute to our understanding of the requirements for dietary components and factors that impact optimal human nutrition. Data generated from these studies will be used for updating dietary recommendations, formulating national nutrition policy, and stimulating new developments by the food industry.

In addition, new insights are needed about increasing the diversity of food products available to consumers. Food product development is no longer solely a food industry issue but is driven by the consumer and market issues. Increased consumer demand for safe, nutritious, healthful, palatable, and convenient foods and global competition call for improvement of foods through enhanced technologies and a greater understanding of physical, chemical and biological processes that affect food product formulation and quality.

Over the next few years, CSREES expects to support projects in the following emphasis areas: human nutrient requirements and nutrient-gene interactions; improving food quality; nutritional impact of functional foods; and human and environmental factors affecting food consumption, with a special emphasis on how those factors relate to obesity.

### **4. Agricultural and Food Security**

Strengthening the nation's capacity to protect its agricultural, food, and natural resource systems from threats arising from endemic conditions, natural disasters, accidents, and possible intentional acts is a major challenge facing the United States. Despite advances in science, new and re-emerging diseases and other agricultural problems occur with an increasing frequency due to a variety of factors, including global trade, changing agricultural practices in production and processing, climate change, pathogen mutations, and germplasm exchange. Effective agricultural security requires systems and programs that reduce vulnerability. Early detection of pathogens, pests and other threats, rapid and accurate assessment, and immediate responses that reduce or prevent the damage, and control the occurrence, are all essential. Yet, available strategies for prevention and control are inadequate for most agricultural threats, both those that are currently inflicting high economic losses as well as future concerns.

During the next five years, CSREES proposes to expand research and integrated competitive programs to further develop the knowledge, expertise and connectivity required to ensure security of our agricultural and rural communities and a secure and safe food supply. A cadre of complementary programs will increase efforts in basic and applied research, education, and extension to reduce the nation's current economic losses due to agricultural diseases, pests and other issues and to prevent disruptions in the production of raw food and non-food products, storage, processing, packaging, distribution, and food service. Programs will address one or more of the components of a successful security program: vulnerability identification and assessment; vulnerability reduction and prevention; monitoring, surveillance and detection; intervention, response and remediation; education and training. Competitive programs addressing agricultural and food security will

provide the basic, foundational knowledge that underpins future breakthroughs as well as applied insights for rapid implementation. Both approaches are needed to assure U.S. consumers a continued safe and affordable food supply, while maintaining U.S. agricultural leadership in international trade and foreign markets.

Agricultural and food security solutions require multidisciplinary approaches. Many programs that address this area will also intersect one or more of the other five competitive program strategic issues.

## **5. Agricultural Opportunity and Rural Prosperity**

During the next five years CSREES will intensify research and integrated program efforts, creating new scientific knowledge to expand access, opportunity, and financial equity and prosperity for agricultural producers, suppliers, processors, distributors, marketers, and consumers of food, fiber, and bio-based products. The NRI will likewise create new scientific knowledge to promote the quality of life for rural people and places through improved economic opportunities, vibrant communities, strong institutions, resilient families, and a healthy environment.

Four areas of emphasis will focus NRI programming efforts in Agricultural Opportunity and Rural Prosperity:

- (a) Structural changes within the food, fiber, and bio-based products system. The goal is to understand the interplay, opportunities, threats, implications, and consequences of macroeconomic policy, globalization, trade liberalizing and trade distorting policies or regulations, and concentration and vertical integration in the food, fiber, and bio-based products sectors, as well as changing consumer behavior. Research on structural changes extends to understanding, discovery and investment in value-added food, fiber, and bio-based products, examining the social, economic, health, and environmental effects of agricultural innovations and practices, and understanding the benefits, risks, and ethical implications of new technologies. Results of such research should identify ways to promote positive and mitigate negative outcomes, and recommend ways to foster equitable distribution of benefits and risks.
- (b) Patterns of rural community change, and institutional and community response to opportunities and threats in the natural, social, economic, political, and geo-political environment. The goal is to understand forces and opportunities affecting rural people and places, to investigate and develop ways to support rural communities experiencing dramatic demographic shifts and structural changes, to assess community and institutional capacity to comprehend and respond to change, and to evaluate and understand community assets such as social and cultural capital, leadership and governance, communication and coordination, rural infrastructure, and rural services.
- (c) Entrepreneurial activities, both agricultural and non-agricultural, as a rural development strategy. The goal is to research economic opportunity to improve quality of life in agricultural and rural sectors, decision-support tools for entrepreneurial farms and firms, development, commercialization, and marketing of value-added, bio-based products, and agricultural productivity and product quality, along with market information and education.
- (d) Resilience of food and fiber producers and rural individuals and families. The goal is to produce scientific knowledge to support health, education, and economic opportunities of rural people, develop family financial security through money management, risk management, and asset development, promote civic engagement, and enhance human capital and youth development.

## **6. Natural Resources and Environmental Quality**

Expanded knowledge in diverse scientific disciplines is needed in natural resources and the environment to address important contemporary issues, not only for agriculture and forestry, but for society as a whole.

Biological systems, including flora, fauna, and humans, influence their environments and are influenced by the quality of their environment. Human activities continue to influence the earth's natural resources and the earth's environment quality at local, regional, national, and global scales. The goal of the basic and applied research in Natural Resources and Environment Quality is to enhance and support our ability to: a) objectively evaluate and predict the effects of natural and human-induced environmental change on the sustainability of agriculture and forestry and on the structure and function of ecosystems; b) effectively manage and/or protect our natural resources with responsible stewardship; c) minimize damage, injury, or other harm to plants and animals; and d) minimize degradation of natural and managed ecosystems, soils, and water resources. Knowledge gained through research is essential to the development of effective management strategies and to the formulation of policy decisions based on sound science.

## ***E. Research Opportunities***

Please note that CSREES offers a number of programs that support research, education, and extension, or a combination thereof. Included in these offerings are the Integrated Research, Education, and Extension Competitive Grants Program, and other programs that deal with food safety, biotechnology risk assessment, and higher education. These programs provide funding for many topic areas related to, but not duplicative of, NRI programs. Applicants are encouraged to examine the other CSREES program descriptions to find the most appropriate source of funding. Eligibility for these programs is noted in each RFA. RFAs can be accessed through the Agency's web site (<http://www.reeusda.gov>; click on "Funding Opportunities").

The following specific research opportunities are provided as a base from which applications for Conventional Projects, AREA, and Integrated Projects can be developed. These descriptions provide boundaries on the scope of each individual program. The NRI encourages submission of innovative projects that are "high-risk," as well as innovative applications with potential for more immediate application.

For research addressing biological issues, agriculturally important organism(s) should be used to accomplish the research objectives. The use of other organisms as experimental model systems **MUST** be justified relative to the goals of the appropriate research program.

***Note to multidisciplinary research teams:** The NRI recognizes the value of research performed as a team effort and recommends the following be taken into consideration when assembling a project team and developing an application for funding. To be competitive, the number of objectives and the level of personnel involved in the application should be appropriate to the NRI program and to the activities proposed. A clear management strategy should be provided which identifies the contribution of each member of the team.*

### **20.0 Animal and Plant Biosecurity**

*Applicants are strongly encouraged to contact the National Program Leaders with questions about the suitability of proposals. For questions regarding animal biosecurity, contact Bob Smith ([rsmith@csrees.usda.gov](mailto:rsmith@csrees.usda.gov); telephone: (202) 401-6861) or Peter Johnson ([pjohnson@csrees.usda.gov](mailto:pjohnson@csrees.usda.gov); telephone: (202) 401-1896). For questions regarding plant biosecurity, contact Kitty Cardwell ([kcardwell@csrees.usda.gov](mailto:kcardwell@csrees.usda.gov); telephone: (202) 401-1790) or Ed Kaleikau ([ekaleikau@csrees.usda.gov](mailto:ekaleikau@csrees.usda.gov); telephone: (202) 401-6030).*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, June 15, 2004.*

*Animal Biosecurity CAP grants are not likely to exceed a total budget of \$5 million for a period of time not to exceed 4 years. Plant Biosecurity project grants are not likely to exceed a total budget of \$1 million for a period of time not to exceed 4 years. In an award's final year, PDs may request a supplement contingent on the demonstration of superior accomplishments, the identification of additional opportunity areas to mitigate or prevent the disease or pest losses, and*

*the availability of program funds. Support will be highly competitive. The amount requested must be commensurate with the activities proposed.*

This program area will help agricultural producers and professionals implement strategies to better safeguard American agriculture from animal and plant diseases and pest losses. It will establish investigator collaboration on animal and plant diseases and pests of high economic impact that are currently endemic in the U.S., or that are future threats due to accidental or intentional introduction through bioterrorism attacks. This approach will help assure a continued supply of safe, high-quality, affordable food and fiber for U.S. consumers and international trade partners.

It is anticipated that this program will be offered for a five-year period. Each fiscal year, proposals will be solicited that respond to specific high priority plant and animal biosecurity needs identified by stakeholders and partners. The program's purpose is not to address all threats to continued prosperity in any particular year; instead, the program will re-prioritize areas of concern each year.

Support will be provided to multi-disciplinary, multi-institutional teams that bridge research, extension, and education efforts to develop practical, cost-effective strategies to minimize or mitigate animal and plant diseases. The program intends to promote collaboration, open communication, the exchange of information and the development of resources (e.g., vaccines, diagnostics, training manuals, Web sites, management recommendations). It aims to reduce duplication of efforts, and integrate activities among individuals, institutions, states, and regions. Therefore, applicants should clearly articulate how the proposal will complement and/or link with existing programs or projects.

The program's intent is to encourage maximum flexibility in preventing or mitigating disease and pest losses. Proposals will be evaluated based on how well their goals and objectives respond to current needs. It is recognized, however, that as an award's comprehensive approach unfolds, unexpected advances and promising leads, or unforeseen new national needs related to a disease or project goal, may be identified. The project team is expected to be capable of responding to these opportunities. As a result, there is an expectation that objectives may be redirected and/or new objectives may be developed (with associated budget adjustments). To encourage flexibility, the program does not expect that all investigators associated with the proposed project will be supported throughout its duration. It is suggested that investigators involved in shorter-term, specific tasks be supported through a series of renewable subcontracts. In their original budgets, applicants may request that no more than 25% of the requested funds be available to accomplish time-critical objectives of national interest that they will determine at a later date. With the approval of the Authorized Departmental Officer, grantees may shift resources to allow additional subcontracts.

Project Directors should plan to present an annual progress report to principal stakeholders (e.g., in conjunction with national producer meetings, workshops, conferences). At the project's conclusion, the project team must present a final report to the principal stakeholders in order to assure widespread dissemination and implementation of the accomplishments (see Part VI, C. for additional reporting requirements). If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part III, B., 12.).

In FY 2004, proposals may be submitted ONLY for the following program areas:

**Animal Biosecurity:** There are a multitude of animal diseases present in the U.S. that cost producers and consumers hundreds of millions of dollars each year. *In FY 2004, this program solicits proposals that address specific selected disease agents or issue areas. Identification of these agents or issue areas is pending the final awards for the FY 2003 program. The selected disease agents for FY 2004 will be announced no later than March 1, 2004 on the NRI website ([www.reeusda.gov/nri](http://www.reeusda.gov/nri)).* Basic and applied research, in conjunction with education and outreach activities to prevent or mitigate losses from the to-be identified diseases, will be encouraged.

Due to the anticipated size of awards, only one or two proposals will likely be funded; therefore, not all diseases may receive funding through this program in FY 2004. These diseases will be selected based on stakeholder input, including commodity, state, and federal partners. The primary focus is to contain, minimize, or eliminate spread of these diseases from animal to animal, animal to human (if applicable), and site to site. Advances in management, biologic control, and surveillance methodologies are expected.

**Plant Biosecurity:** The objective of this subsection is to conduct basic and applied research, in conjunction with education and outreach activities, for high-risk pathogens/pests of regional or national importance, to develop:

- Early detection, diagnosis and monitoring tools with strategies for mitigation, control, and elimination of introduced high-risk organisms; and
- Rapid response plans that include the ability to predict the spread of high-risk organisms.

Proposals should be developed for research, extension and education projects that will further the objectives of enhancing agricultural plant security on a national basis.

Hypothesis-driven projects are sought which address one or more of the following three needs:

- Early detection and monitoring tools are needed to detect pathogens/pests before they are symptomatic, spread, and become established. Hypothesis-driven research focused on the utilization of novel genomic sequences for laboratory and field-applied methods of rapid and reliable diagnostic assays is a priority of the program. Assays are particularly sought for specific strain identification and virulence prediction across a broad class or group of pathogens and pests. The development, testing, and application of multiplexed polymerase chain reaction and diagnostic micro-arrays are encouraged. Applicants may utilize other tools, including the application of innovative concepts from areas such as remote sensing and nanotechnology. Research on forecasting and monitoring strategies for early detection may also be proposed;
- With a focus on high-impact pathogens/pests, priority areas include: the development, validation, and statistical comparative analysis of various risk-assessment procedures as they relate to variations in host-plant resistance and environmental conditions; disease/pest spread and environmental persistence, including the development and testing of predictive models that can be applied under different environmental and management conditions for more than one class of organism and host plant. If a model system is proposed, it should have potential for wider application to other pathogen/pest/host systems; and
- The development of statistically valid, critical assessments of robust field-based pathogen identification, reporting, and confirmation systems that can be applied to various pathogens/pests and crops are a priority.

Additionally, projects are requested that:

- Focus on development of improved diagnostics, management approaches, and/or other tools that can be integrated into prevention/mitigation/recovery biosecurity programs that are likely to be ready for deployment in the short term and include implementation plans;
- Focus on vulnerable cropping systems, large area or high economic consequence crops, and high risk pathogens and/or provide model systems for further application.

## **22.1 Plants and Environmental Adaptation**

*Investigators are encouraged to contact Gail McLean, National Program Leader at (202) 401-6060 regarding questions about suitability of research topics (or at [gmclean@csrees.usda.gov](mailto:gmclean@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 23, 2004*

The future of agricultural productivity and sustainability depends on the ability of crop plants to grow and be productive in response to a changing environment. To lessen impacts on yield, agricultural plants will need to adapt to environmental changes such as those brought about by global change or by drought. Plants will also need to adapt to potentially poor

soil and nutrient conditions caused by loss of farm land, pollution, and leaching of nutrients. Plus, as the world's population continues to grow, inhospitable land will need to be used for agriculture. The goal of this program is to enable both the improvement of plant productivity during environmental stress and the development of agriculturally important plants tolerant to various environmental conditions and stresses. This research will provide the basic knowledge needed to devise strategies for decreasing the impact of environmental stress, for restoring or protecting the ecosystems and the environment, and for adapting agricultural and forest practices to environmental changes due to global climate fluctuations.

Specifically, proposals should address the characterization and understanding of the molecular, biochemical, and/or physiological mechanisms involved in a plant's response and/or adaptation to global change, drought, or poor soil conditions. Proposals should be based on testable hypotheses and go beyond descriptive levels of experimentation. Proposals should focus on the mechanism(s) used by a specific plant in adaptation to or tolerance of the specific environmental condition.

This program invites both fundamental and mission-linked proposals for innovative research on plant responses to global change, drought, and/or poor soil conditions. Proposals are invited in the following priority areas: (a) identification and analysis of genes and gene products involved in generating or regulating the plant's response to an environmental stress; (b) identification of physiological, biochemical, cellular, and morphological changes that are part of the plant's mechanism of response to the stress, including putative adaptive responses favoring plant growth during or recovery from an environmental perturbation; and (c) characterization of the fundamental mechanisms by which environmental stress signals are perceived by plants and transduced into changes in biochemical, physiological or morphological processes. Proposals with a physiological ecology approach are encouraged. The integration of molecular biology methods with physiological and ecophysiological approaches is particularly encouraged. Studies using model plants are appropriate but relevance for agriculture must be clearly demonstrated.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **23.1 Managed Ecosystems**

*Investigators are encouraged to contact Diana Jerkins, National Program Leader at (202)401-6996 regarding questions about suitability of research topics (or at [djerkins@csrees.usda.gov](mailto:djerkins@csrees.usda.gov) to arrange a telephone consultation.)*

*Standard Research project awards and Integrated Project awards for this program are expected to have a total budget (including indirect costs) of no less than \$400,000 and no more than \$800,000 for 2-4 years of support. Funds awarded will not exceed \$800,000.*

*Program Deadline: Proposals must be **received by 5:00 P.M., Eastern Time, March 16, 2004***

The goals of this program are to understand the impact of agriculture, forest, natural resource, and rangeland practices on ecological systems and to promote their sustainability for the production of food, fiber, and forage. Sustainable productivity depends on the ability to utilize the earth's renewable natural resources without depleting them. This program strives to understand how practices affect natural and managed ecosystems while developing improved management strategies to achieve sustainability.

Ecological issues in agriculture and natural resources are complex, requiring a systems approach to integrate physical, biological, ecological, social, and economic sciences. Ecosystems research should be multi-disciplinary and applicable at differing spatial and temporal scales. It should also evaluate the synergism between components within the system, and the potential for movement towards increased sustainability of the system.

The Managed Ecosystems Program acknowledges the role humans play in effecting environmental change in crop, range, forest, aquatic, and estuarine ecosystems. Management analysis of ecosystems should respond to the effects of global

changes, support environmental quality, and incorporate sustainable strategies. This program will support research using mechanistic or experimental approaches to: 1) understand ecological processes as they pertain to agricultural (food, fiber, forage) land use and management practices, and 2) develop and test innovative management strategies for improved sustainability management decisions that should lead to optimization of production, conservation, and restoration of farm, forest, and rangeland through systems analysis, design, and innovative practices. Descriptive research that incorporates productive modeling as a component of the systems analysis will be accepted. Models should reflect the complexity of ecosystems being studied.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

- (1) Ecosystem health and development as a key to sustainability of an ecosystem – Use of innovative management systems to achieve optimal agricultural and natural resource productivity while maintaining ecosystem health and social and economic development. Proposals should lead to an understanding of the full impact of land use and land management strategies, evaluation of on-site and off-site environmental impacts on air, water or land quality, and related ecosystem health and diversity and impacts on economic returns to the production of food, fiber, and forage. Proposals could include the development and testing of innovative methodology, analysis of an existing system, design and validation of an improved system, and/or development of indicators or other means of system evaluation, efficiency of land management strategies.
- (2) Ecosystem restoration and conservation – Investigate the science of restoring and conserving natural structural and functional integrity to ecosystems deleteriously affected by human agricultural activities. The focus area will provide science-based tools and educational deliveries to reverse habitat degradation in wetlands, riparian areas, streams, lakes, forests, and rangelands and to enhance native floral and faunal biodiversity. Cropping and grazing systems research will evaluate the integration of natural ecosystem models into management activities and the interface with natural ecosystems to enhance biodiversity and resource sustainability. Environmental process models may be developed in order to predict changes in environmental quality that occur as a result of changes in agricultural, restoration, and conservation activities.
- (3) Fire management – After a century of suppression through management, wildfire has emerged as a major threat to human well-being and to natural ecosystems throughout the country. Research is needed to support the President’s Healthy Forest Initiative by contributing knowledge to improve alternative forest and rangeland fuel management approaches, especially at the urban-rural interface. Research is particularly needed on the use of prescribed fire as a management tool to deal with fuel loads, natural regeneration, and control of invasive species.
- (4) Animal manure management – There is a need to prevent the degradation of air, soil, and water resources by food animal production systems and to protect the ecological integrity of forest, rangeland, cropland, aquatic, estuarine, and marine systems. Proper management of manure resulting from various production systems is a critical issue facing the food animal industry. Food animal feeding operations vary by region, species, size and management requirements, so that each operation is site-specific and must be managed accordingly. The overall goal is to improve the environmental and economic quality of these field and feeding sites. Proposals are encouraged that will focus on the fate, transport, and treatment of nutrients, pathogens, pharmaceuticals, and endocrine disruptors from livestock and poultry manure and wastewaters within the ecosystem.
- (5) Policy assessment – Understanding agricultural sector decision-making about managed ecosystems, to support improved public and private decision-making. To develop econometric and/or simulation models to understand and predict decisions by the agricultural sector under changing opportunities and economic/policy conditions, with particular attention to choices of land use and management practices. Support could be provided for linking the models of agricultural sector decision-making to environmental process model(s) or set of indicators that predict the impacts of changes in environmental quality with changes in agricultural activities, as well as for linking models or indicators predicting the changes in social value associated with the changes in environmental quality. Validation of the environmental process models should be conducted on ecosystems affected by the policy being evaluated. Appropriate validation of the decision-making models should also be conducted. To promote improved decision-making, the models should be designed so that alternative policy approaches could be represented within the model

framework, and changes in agricultural decision-making predicted as a result of policy changes. Policies of interest include incentive-based and regulatory-based systems.

This program also invites proposals for projects that integrate research, extension, and/or education to address ecosystem health (see priority “(1)” above) and fire management (see priority “(3)” above). The NRI will use no more than 20% of available funds to support integrated projects; these funds will not be distributed uniformly across all NRI programs.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

## **25.0 Soils and Soil Biology**

*Investigators are encouraged to contact Nancy Cavallaro, National Program Leader at (202) 401-4082 regarding questions about suitability of research topics (or at [ncavallaro@csrees.usda.gov](mailto:ncavallaro@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004*

Soils provide physical support, water and nutrients to terrestrial plants and are recipients of plant and animal (including human) materials. As such, soils serve as the location of key interactions between the abiotic and biotic components of terrestrial ecosystems. It is here that many of the essentials for the production of biomass are obtained and that nutrients from dead biomass are recycled into usable forms. Both static and dynamic soil properties affect the water, gases and solutes that pass through and over soils. We must further our understanding of the basic mechanisms contributing to the immense diversity in soil chemical, physical, and biological characteristics and processes if we are to succeed in both sustaining agricultural production and maintaining or improving soil and environmental quality in crop, forest, and rangeland systems.

Abiotic and biotic processes, and the linkages among these, regulate the flow of materials and energy within soils and sediments. However, the mechanisms controlling individual and coupled soil processes in the field remain poorly understood. This program will support both basic and applied (mission linked) research on chemical, physical, and/or biological processes of managed and unmanaged soils and sediments. Genetic and molecular biology proposals will also be accepted to examine the existing capacities or community structures of natural soil biota. Major issues to be addressed are problems related to manure and other wastes, amendments, and contaminants applied to soils, problems related to disturbances such as extremes in precipitation, ecosystem disturbances, and changing land use. Proposals may include social, policy and economic aspects of these issues.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: (a) ecology and community dynamics of belowground biota (including roots, mycorrhizae, bacteria, fungi and soil fauna) and their interactions within the soil environment; (b) methods, models, and controlling processes and mechanisms for understanding and predicting bioavailability and transport of energy, colloids, sediments, solutes, gases and biota; (c) nutrient management and carbon sequestration; (d) basic biochemical, genetic, and molecular mechanisms employed by natural or introduced microorganisms, flora and fauna in the uptake, degradation, or transformation of agrochemicals and other contaminants; and (e) development of or improvement to methods to measure and monitor and predict changes in soil properties, and relate static soil characteristics to dynamic soil properties or fluxes (e.g., estimating trace gas emission potentials from spatial associations of soil texture, moisture and carbon content; development of quantifiable indices of soil quality).

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been

listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*See other NRI programs with targeted objectives that may include research on soil organisms, transport properties, gas fluxes, manure and waste management. These include Plants and Environmental Adaptation (22.1), Biology of Plant-Microbe Associations (51.8), Watershed Processes and Water Resources (26.0), and Air Quality (28.0). For proposals that deal with water quality and have outreach and/or education components, see the Integrated Research, Education, and Extension (406) Program in Water Quality (separate RFA).*

## **26.0 Watershed Processes and Water Resources**

*Investigators are encouraged to contact Nancy Cavallaro, National Program Leader at (202) 401-4082 regarding questions about suitability of research topics (or at [ncavallaro@csrees.usda.gov](mailto:ncavallaro@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004*

The nation's water resources are fundamental to the productivity and health of crop, range and forested lands. Continued production of food and fiber, and the long-term sustainability of healthy, natural and managed watersheds are dependent upon a reliable and sustainable supply of fresh, unpolluted water. Research in the Watershed Processes and Water Resources Program is aimed at understanding the processes that influence water quantity and quality in these natural and managed watersheds, and developing appropriate technologies and management practices to maintain or improve these resources.

This program invites both basic and mission-linked proposals for innovative research in understanding **fundamental processes** and developing appropriate **technology and management practices** for watersheds and water resources. It is anticipated that results from this research will have regional or national applicability and will be transferable or applicable to different regions, landscapes, soils, and/or vegetative environments. Multi-disciplinary studies are encouraged.

Proposals are invited in the following priority areas:

**Fundamental Processes:** This program goal is to increase understanding of fundamental processes relating to quality, quantity, and movement of water and its dissolved and suspended solids in and from rangeland, forested, and agricultural watersheds at diverse spatial scales. Field and laboratory studies, as well as computer simulation modeling efforts are considered viable research approaches. These studies should address appropriate spatial scales. Studies conducted at smaller scales should address the implications of the results to the watershed scale. Priority research focus areas in this category are: (a) Processes governing origin, transport, and fate of water, sediment, nutrients, solutes, and pathogens from forest, rangeland, and agricultural watersheds to both surface waters and ground water. This includes anthropogenic influences on watershed water quantity and quality, such as dams, water diversions, irrigation, return flows from diverted water, etc., (b) Properties and processes related to water resource and watershed responses to disturbance, including climate change, fire, precipitation extremes and their consequences, ecosystem disturbances, and land use change, (c) Modeling efforts developed at the watershed scale and aimed at understanding hydrologic processes at different spatial and temporal scales and across different regional settings.

**Management, Technology, and Consumptive Uses:** This program goal is to improve and assess water resource management strategies and increase understanding of the role of water resource management on the quantity and quality of water resources particularly at the watershed scale. This includes studies of the human and social dimensions and policy effects of water resource issues. Priority research focus areas in this category are: (a) Water resource management strategies to improve effective, efficient and sustainable use of water in production systems while reducing impacts on the environment, and (b) Development of new technologies or management strategies that promote protection of surface and

ground water from chemical or biological contamination, particularly (but not limited to) those originating from animal production operations.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*See other NRI programs with targeted objectives that may include research on soil organisms, transport properties, gas fluxes, manure and waste management. These include Soils & Soil Biology (25.0), Managed Ecosystems (23.1) and Air Quality (28.0). For proposals that deal with water quality and have outreach and/or education components, see the Integrated Research, Education, and Extension (406) Program in Water Quality (separate RFA).*

## **28.0 Air Quality**

*Investigators are encouraged to contact Ray Knighton, National Program Leader at (202) 401-6417 regarding questions about suitability of research topics (or at [rknighton@csrees.usda.gov](mailto:rknighton@csrees.usda.gov) to arrange a telephone consultation).*

*Integrated and Research project awards for this program are not likely to exceed a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, June 15, 2004*

Agriculture, forest, and range production practices have increasingly become subject to state and federal regulations that are meant to protect air resources. In many instances, data do not exist or are not representative of agricultural industries for the purpose of estimating emissions to the atmosphere of regulated pollutants or of public nuisances such as odors and fugitive dust. The goal of this program is to develop emission data for agriculture, forest, and range production practices and to improve understanding of odor, gases, and particulate matter (PM) measurement, production, flux, fate and transport. Specific emphasis will be placed on compounds that are regulated by state and federal agencies and geographic regions that are in non-attainment of national ambient air quality standards.

This program invites proposals for projects that integrate research, extension, and/or education in the following priority areas:

### **A) Emission Factors**

Emission data for particulates, odors, and gases is needed for all aspects of production practices and naturally occurring events to update existing inventories. High priority emission sources and corresponding constituents are:

- animal feeding operations (especially PM, ammonia, hydrogen sulfide and methane)
- tillage and nutrient management (especially PM and nitrous oxide)
- controlled burning
- production, harvest and post-harvest practices
- wind and wet deposition

### **B) Measurement and Monitoring**

Research is also solicited to improve measurement protocols/instrumentation and remote sensing to measure and characterize particulate matter and gases for within field/facility and edge-of-field/facility boundaries. Projects should identify whether research will address fine particulate matter (< 2.5 microns in diameter) or larger (up to 10 microns in diameter). Research to determine the efficacy of techniques for monitoring and characterizing agriculturally important odors, odorants, and aerosols is also requested.

### **C) Fate and Transport**

Research is needed on the fate and transport of emitted particulates and gases. Topics of interest are fate of a particular nutrient or particulate that could become an important air emission source. Improved models are needed to

predict movement and dispersion of air pollutants from production practices and management operations. Process-based mechanistic models using mass balance techniques of the whole enterprise are of specific interest.

#### **D) Mitigation**

Methods for mitigating emissions of air pollutants and the development of best management practices are also needed. Projects will be considered that evaluate the efficacy of conservation practices and other control technologies to reduce particulate and gaseous emissions, have technology transfer and education objectives, and demonstrate stakeholder participation.

#### **E) Air Quality Technology Transfer**

Proposals are solicited to organize a national workshop in calendar year 2005. The workshop will have the express purpose to create a document that will be used to improve emission inventories for air pollutants, to recommend changes and improvements in measurement technologies and monitoring methodologies, and recommend best production practices to mitigate air pollutant emissions.

This program also invites both fundamental and mission-linked proposals for innovative research on fate and transport (see priority C) above). The NRI will use no more than 20% of available funds to support integrated projects.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **31.0 Improving Human Nutrition for Optimal Health**

*Investigators are encouraged to contact Etta Saltos, National Program Leader at (202) 401-5178 regarding questions about the suitability of research topics (or at [esaltos@csrees.usda.gov](mailto:esaltos@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by 5:00 P.M. Eastern Time, January 23, 2004.***

*IMPORTANT NOTE TO THE HUMAN NUTRITION RESEARCH COMMUNITY: In response to the National Research Council's evaluation of the NRI and other stakeholder/partner assessments, many NRI programs, including this one, are now evolving to a more issue-based focus. In this fiscal year, the presentation of research priority areas has changed. Please read the new program description carefully. With limited resources for a very broad area, the program has begun a transition phase to increase award size in fewer areas. During the coming year, the program will be collecting additional input from partners and stakeholders. In Fiscal Year 2005, further focusing of the program is anticipated.*

The consumption of a nutritious diet is important for maintaining long-term health and decreasing the risk for chronic disease. The primary objective of this program is to support research that contributes to our understanding of appropriate dietary practices throughout the life cycle and factors that affect these requirements such as gender, race, age and ethnicity. Studies to determine the effects of dietary components on gene expression are also needed, as are studies to improve our understanding of the role of foods and their biologically active components (e.g., phytochemicals) in promoting health.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

- (a) human nutrient requirements throughout the life cycle;
- (b) cellular and molecular mechanisms influencing nutritional status, especially those mechanisms responsible for the influence of dietary components on gene expression;

- (c) bioavailability, efficacy and safety of physiologically active dietary components;
- (d) interrelationships among dietary components; and
- (e) mechanisms underlying the relationship between diet and optimal health, e.g., influence of dietary components on the immune, cardiovascular, and central nervous systems.

Model systems, whether biological, mathematical, or economic, must explicitly address the goals of the Improving Human Nutrition for Optimal Health Program. Multi-disciplinary approaches are encouraged.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*Support will not be provided for research on dietary requirements as related to therapies for metabolic disorders, infectious diseases, cancer, and alcohol-related disorders, or for the establishment, expansion, or maintenance of dietary databases. Surveys of the nutritional status of population groups are acceptable only if they are a component of a dietary assessment or intervention study. Studies on the use of dietary supplements to improve health are acceptable only if the supplement is derived from an agricultural product.*

*Proposals dealing with food processing techniques, or the utilization or production of foods should be directed to the Improving Food Quality Program (71.1) unless they are clearly oriented toward dietary effects on optimal human health. The Improving Human Nutrition for Optimal Health Program will **NOT** accept proposals on topics related to obesity or consumer food choices in FY 2004. Proposals related to these areas should be directed to the Human Nutrition and Obesity Program (31.5).*

### **31.5 Human Nutrition and Obesity**

*Investigators are encouraged to contact the National Program Leaders, Etta Saltos ([esaltos@csrees.usda.gov](mailto:esaltos@csrees.usda.gov); telephone: (202) 401-5178) or Susan Welsh ([swelsh@csrees.usda.gov](mailto:swelsh@csrees.usda.gov); telephone: (202) 720-5544) with questions about the suitability of proposals.*

*Program Deadline: Proposals must be **received by** 5:00 P.M. Eastern Time, June 15, 2004.*

*Integrated project awards from this program area are not likely to exceed \$1 million for project periods up to 4 years.*

A new crosscutting program area is announced to address the complex problem of obesity. This program area seeks to support proposals that integrate research, extension, and education.

Over the past decade, growing knowledge of the genetic, physiological, psychological, metabolic, and environmental influences on body weight has increased awareness of the complexities of weight management. New research has provided a basis for evaluating traditional intervention strategies and outcomes. The goal of this program is to fund innovative projects that will use a food systems approach to study critical factors that relate to obesity so that resulting knowledge can be applied to the development and evaluation of effective interventions. The food system encompasses agricultural production, processing, packaging, marketing, purchasing, preparation, and consumption.

This program invites proposals for integrated research, education and/or extension projects in the following priority areas: (a) the influence of social and psychological factors, including the development of self-esteem, self-efficacy and resiliency, family and community influences and attitudes toward food, diet and health on the development of obesity; (b) the role of lifestyle, including physical activity, cultural and ethnic factors and the influence of past dietary patterns, in determining body weight; (c) the role of educational factors, cognitive ability and informational resources in determining body weight; (d) the impact of genetic, hormonal, biochemical and physiological factors on body weight; and (e) the influence of economic factors and public policy issues, including the community environment, food availability, accessibility, cost, individual income and propensity to save, and public and private assistance programs on the development of obesity.

Interventions may target cellular and physiological systems, individuals, groups, market segments, communities, and other components of food systems. Vulnerable population groups, including children, adolescents, ethnic minorities, and economically, educationally, or socially disadvantaged groups, are of special concern.

Applicants should bring together stakeholders and representatives of the disciplines, functions, and institutions necessary to carry out the objectives within the projected time frame. Evaluations may address newly developed or existing interventions. Research may need to address the development, modification and validation of innovative assessment tools. Support for postdoctoral or graduate student training is encouraged. Applicants may also request partial support for conferences related to the topics listed above.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.). The NRI will use no more than 20% of available funds to support integrated projects.

*Support will not be provided for projects that focus primarily on medical therapies for disease. Proposals dealing with human nutrient requirements, and the impact of dietary components on human health should be directed to the Improving Human Nutrition for Optimal Health Program (31.0). Proposals dealing with food processing techniques, or the utilization or production of foods should be directed to the Improving Food Quality Program (71.1).*

## **32.0 Food Safety**

*Investigators are encouraged to contact Etta Saltos, National Program Leader at (202) 401-5178 regarding questions about the suitability of research topics (or at [esaltos@csrees.usda.gov](mailto:esaltos@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by 5:00 P.M. Eastern Time**, March 16, 2004.*

***IMPORTANT NOTE TO THE FOOD SAFETY RESEARCH COMMUNITY:** In response to the National Research Council's evaluation of the NRI and other stakeholder/partner assessments, many NRI programs, including this one, are now evolving to a more issue-based focus. In this fiscal year, the presentation of research priority areas has changed. Please read the new program description carefully. With limited resources for a very broad area, the program has begun a transition phase to increase award size in fewer areas. During the coming year, the program will be collecting additional input from partners and stakeholders. In Fiscal Year 2005, further focusing of the program is anticipated.*

The primary objective of this program is to increase our understanding of disease-causing microorganisms, their products, naturally occurring toxicants and chemical contaminants in meats, poultry, seafood, and fresh fruits and vegetables. Food safety concerns cover a broad spectrum, from on-farm production, post-harvest processing, distribution, and food preparation, to consumption. There is a critical need to increase our understanding of the ecology of food borne pathogens, their products, naturally occurring toxicants and chemical contaminants (e.g., pesticide and antibiotic and other drug residues) so that better intervention strategies can be developed and so that practical, sensitive and specific detection methods can be developed, as present ones take excessive time and resources. In addition, mechanisms that lead to antibiotic resistance need to be elucidated. Moreover, a better understanding of the impact of economic factors on the incidence of foodborne illness is needed.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

(a) development of strategies to control, eliminate, or prevent disease-causing microorganisms, naturally occurring toxicants or chemical contaminants in food (including the study of microbial ecology; determining potential sources of toxicants; understanding resistance to traditional food processing and preservation techniques; understanding pathogenesis; understanding the mechanisms leading to antibiotic resistance; and development of practical and

economical intervention strategies); (b) identification of economic factors affecting the food supply that can have an impact on incidence of foodborne illness or of the economic impact that regulations intended to safeguard the food supply can have on producers, processors, and consumers; and (c) development of improved detection methods for foodborne microbial agents, naturally occurring toxicants and chemical contaminants **when** a direct and persuasive linkage can be made for the use of such methods in advancing the understanding of the natural history and mechanism of foodborne illness, or the means of pathogen or toxin transmission or persistence in the host or environment. Development and testing of diagnostic tests simply for the purpose of disease detection or surveillance is not appropriate for this program and will not be considered.

Multi-disciplinary studies are **strongly** encouraged.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*Research on food processing techniques that are designed to improve food quality (e.g., improve sensory characteristics, lengthen shelf life) should be directed to the Improving Food Quality Program (71.1). For pathogens that affect both animal and human health, if the proposal's primary goal is to safeguard animal health rather than to reduce the risk of pathogen exposure to humans, proposals should be directed to the Animal Protection Program (44.0). Proposals on food safety education for consumers or food handlers should be directed to the Integrated Research, Education, and Extension (406) Program, which was announced in a separate RFA.*

### **32.1 Epidemiological Approaches for Food Safety**

*Investigators are encouraged to contact Mary Torrence, National Program Leader at (202) 401-6357 regarding questions about suitability of research topics (or at [mtorrence@csrees.usda.gov](mailto:mtorrence@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of up to \$1,500,000 for 2-4 years of support.*

*Program Deadline: Proposals must be **received by** 5:00 P.M. Eastern Time, March 16, 2004.*

Research that develops an understanding of the multiple factors involved in food safety and provides the science-based data for policy decisions requires epidemiological studies. Significant gaps exist in the knowledge base for food safety and the risk factors involved in the entire continuum of food production, from farm to table. Epidemiological studies of pre- and post-harvest areas are vital to identify and characterize pathogenic organisms, including their sources and reservoirs; and to understand the transmission of the pathogen along the entire continuum. The identification of risk factors for exposure to and infection by these pathogens can be accomplished by several different epidemiological research methodologies. These methodologies can be applied at any stage of food production. Environmental and ecological data are needed to increase our understanding of disease-causing microorganisms, their products, and naturally occurring contaminants in meats, poultry, seafood, and fresh fruits and vegetables. Population-based studies that provide data for identified data gaps from risk assessments or provide field data for on-going risk assessments will be considered. *Pure risk assessment methodologies or modeling studies are **not** eligible.*

Proposals **must have** a primary central focus on population-based epidemiological studies. *Proposals concentrating strictly on laboratory methods or techniques will **not** be accepted. Method developments that are hypothesis-driven should be submitted to 32.0 Food Safety.* Simple prevalence studies or studies that have already been done numerous times are **not** encouraged. Applications must propose research that is new, innovative, or in high priority areas for agriculture and public health. Proposals that involve identifying and evaluating risk factors and evaluating and implementing strategies to reduce foodborne pathogen levels or disease will receive the highest priority.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: (a) identification and evaluation of risk factors that affect the levels, transmission, or persistence of foodborne

organisms or the prevalence of foodborne disease; (b) identification, implementation, and evaluation of possible intervention or management strategies; (c) identification of farm-based solutions that contribute to decreased prevalence of foodborne pathogens; (d) development of outcome measures for the impact of intervention or management strategies on microbial contamination or food safety.

In a newly encouraged area, one grant may be awarded that proposes the establishment and maintenance of a centralized repository of samples that have been collected during epidemiologic food safety studies at the preharvest level and that can consequently be used in a new collaborative research project. Proposals will outline the establishment of the repository, guidelines for contributing to the repository and for sharing samples, and will describe the maintenance and operation of the data bank of samples. This data bank will consist of samples from researchers from multiple institutions, multiple epidemiologic research studies, and various regions. Proposals must have i) a team that already has a strong working relationship; ii) the samples have already been collected during an epidemiologic food safety study (population-based); iii) identified a new research study where these samples will be used collaboratively.

Priority will be given to projects that involve collaboration with institutions, organizations, and communities of interest. Strong partnerships are encouraged, such as those that form consortia or centers of excellence. Innovative multi-disciplinary collaborations and partnerships are those designed to build solutions for understanding the interrelationships of the various factors that affect the safety of our food supply. Proposals that integrate the knowledge of several disciplines, e.g., veterinary science, food microbiology, epidemiology, public health or other scientific disciplines, in order to gain the comprehensive understanding needed to solve complex problems are requested. A systems-based approach that takes a broad rather than reductionist view, and thus describes how a set of elements or components are related and how those relationships are relevant to problematic situations, is encouraged.

In addition to the evaluation factors described in the Review Process section of this document, the proposals will be evaluated on how well the Project Description addresses the following issues.

a) **Strength of Collaboration.** Describe how the project will involve partners and communities of interest. Describe how and by whom the focus and scope of the project were determined, how partners will be involved during the course of the project, and how end users will be impacted by results. Provide evidence that arrangements necessary for collaborative partnerships have been discussed with the parties involved and can realistically be expected to come to fruition, or have actually been finalized contingent on an award under this program. Evidence must be provided via letters by the parties involved.

b) **Strength of Coordination and Management.** Describe how the project will be coordinated among the various participants and clearly describe the nature of the collaborations. Describe plans for management of the project to ensure its proper and efficient administration.

c) **Relevance of the science-** Justify that the research problem being studied is of high priority nationally to the food safety area, to agriculture, or public health. Justify that this research is new and innovative and not a repetition of other published data or studies. Describe its unique contribution to food safety, agriculture, and public health.

During the review process, applications that address the listed program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **32.2 Food Safety - Coordinated Agricultural Project (FS-CAP)**

*Investigators are encouraged to contact Mary Torrence, National Program Leader at (202) 401-6357 regarding questions about suitability of research topics (or at [mtorrence@csrees.usda.gov](mailto:mtorrence@csrees.usda.gov) to arrange a telephone consultation).*

*A CAP award is not likely to exceed a total budget (including indirect costs) of \$5 million for a period of time not to exceed 4 years. This program **is not accepting proposals** for Agricultural Research Enhancement Awards, including Postdoctoral Fellowships, New Investigator Awards, and Strengthening Awards which include Research Career Enhancement Awards, Equipment Grants, and Seed Grants; and Strengthening Standard Research Project Awards.*

*The FS-CAP anticipates making only one award this year to a multi-disciplinary, multi-institutional, and multi-state team that could collectively identify and act on priority research areas in the preharvest food safety area with the goal of providing recommendations for prevention, control, or interventions that will produce and impact on food safety. CAP Awards will be made as continuation grants (See Part II. C.). In an award's final year, Project Directors may request a supplement contingent on the demonstration of superior accomplishments, the identification of additional opportunity areas for food safety and availability of program funds.*

*Program Deadline: Proposals must be **received by 5:00 P.M. Eastern Time, March 16, 2004.***

*Letters of Intent:*

*While not required, it is requested that applicants notify CSREES of their intent to submit applications by emailing letters of intent to Mary Torrence, National Program Leader ([mtorrence@csrees.usda.gov](mailto:mtorrence@csrees.usda.gov)) by COB on February 17, 2004. The letter should contain: (1) a descriptive title of the proposed project; (2) names and roles of the PD(s) and other key personnel, along with their institutions; and (3) a brief statement of approaches and objectives (500 words or less). CSREES may not provide applicants with feedback regarding the content of these letters. Failure to submit a letter of intent will not preclude consideration of an application.*

This new program emphasis may support one proposal (\$4-5 million) for the establishment of an epidemiology and microbiology research unit for food safety that will conduct collaborative and interactive, multi-faceted epidemiologic food safety research, primarily in the preharvest area. In subsequent years, the FS-CAP may be focused on one or more specialized areas of food safety.

One award may be given to a team of epidemiologists and microbiologists that could collectively identify priority food safety problems to be solved by a multi-disciplinary, multi-institutional, and multi-state team of experts. Unit participants would also serve as a strike team that would be able to conduct targeted research in response to an emerging or priority area. This research unit will contain expertise in epidemiology, microbiology, food safety, public health, economic and other identified needs and will also contain experts in prevalent food borne pathogens and important food animal species. Proposals should outline the potential of this unit; the structure, coordination, and plan of implementation for funding and research; and propose several research areas that will be evaluated during the study period.

Proposals are expected to propose coherent, complementary research activities with the ultimate goal being a strategy or solution that may be implemented to reduce, control, or prevent food borne disease, or reduce food borne organisms along the food production continuum, or to provide data on risk factors that would influence management or control programs. Comprehensive approaches are expected to include coordinated work on several of the following areas: the epidemiology of food borne disease, particularly at preharvest and the identification and evaluation of risk factors that can be useful for the implementation and evaluation of management practices, intervention and control strategies for the reduction of food borne organisms.

Multi-disciplinary teams are encouraged that include specialists in these areas: epidemiology, microbiology, veterinary medicine, animal production, public health. **The ideal food safety team would include 1-2 nationally or internationally recognized experts in each of the major food-borne pathogens, as well as 1-2 experts for each of the contributing disciplines that would support advancement towards prevention.**

Projects must demonstrate that:

- i) the investigators already have a documented working research collaboration in epidemiology and food safety
- ii) the program director and lead institution have a strong veterinary epidemiologic focus and expertise in a broad range of preharvest food safety areas
- iii) the team is strong in other food safety related disciplines particularly food microbiology, veterinary medicine, and public health and have on-going research in such diverse food safety issues as aquaculture, microbial contamination of produce, beef, poultry and swine food safety and in such diverse organisms as *Campylobacter*, *Salmonella* and *E. coli*.
- iv) the team is able to respond quickly to provide timely research data in a variety of possible food borne outbreaks or emerging issues, including the coordination of research expertise, methods, and samples.
- v) the team has a strong relationship with a public health school/investigators.
- vi) the team has identified an advisory group with principal stakeholders and partners.

It is also the program's intent to encourage maximum flexibility in preventing or controlling food borne organisms and disease. It is recognized that there may be unexpected new organisms or outbreaks that might occur or an unidentified need that requires response. As a result, there is an expectation that objectives may be redirected and/or new objectives may be developed (with associated budget adjustments). To encourage flexibility, the program does not expect that all investigators associated with the proposed project will be supported throughout its duration. It is suggested that investigators involved in shorter-term, specific tasks be supported through a series of renewable subcontracts. In their original budgets, applicants may request that no more than 25% of the requested funds be available to accomplish time-critical objectives of national interest that will be determined at a later date. With the approval of the Authorized Departmental Officer, grantees may shift resources to allow additional subcontracts. Project directors should plan to present an annual progress report to principal stakeholders (e.g. in conjunction with national producer meetings, workshops, conferences). At the project's conclusion, the project team must present a final report to the principal stakeholders in order to assure widespread dissemination and implementation of the accomplishments (see Part VI, E. For additional reporting requirements). If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.). It is expected that the results will be presented at a national meeting and that there would be several collective manuscripts submitted.

During the review process, applications that address the stated program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget.

#### **41.0 Animal Reproduction**

*Investigators are encouraged to contact Mark Mirando, National Program Leader at (202) 401-4336 regarding questions about suitability of research topics (or at [mmirando@csrees.usda.gov](mailto:mmirando@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research and Integrated project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004.*

Reducing infertility in breeding populations of agriculturally important animals, including aquacultured species, is of major importance for efficient animal production. In several species, fertility has declined significantly over the past several decades. New knowledge is needed to improve fertility and facilitate implementation of integrated animal production systems that will contribute to sustainability of the animal production unit. This information will control or reduce animal production costs, provide product cost benefits to consumers, and may ultimately lead to increased productivity from fewer animals, thereby conserving natural resources and enhancing the environment. Approaches developed to foster and manage animal reproduction are key to future application of biotechnologies. Therefore, the objective of this program is to increase our knowledge of reproductive biology in agriculturally important animals with the goal of reducing infertility and improving overall reproductive management in animal production systems.

This program invites both fundamental and mission-linked proposals for innovative research on current major problems related to fertility of agriculturally important species. Proposals are invited in the following priority areas: (a) basic mechanisms regulating fertility; (b) identifying and ameliorating the causes of infertility; (c) decreasing the interval from parturition to conception; (d) improved cryopreservation of gametes to enhance agricultural biosecurity and preserve genetic resources; (e) improvement of sterilization methods or development of monosex populations in agriculturally important species.

This program also invites proposals for projects that integrate research, extension, and/or education to address the growing problem of infertility in dairy cows (see priority "(b)" above). The NRI will use no more than 20% of available funds to support integrated projects; these funds will not be distributed uniformly across all NRI programs.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

Research proposals emphasizing functional genomic approaches and other new technologies are encouraged. Proposals that incorporate strategies with immediate application to the animal and/or aquaculture industries are also encouraged.

**All model systems (especially the use of laboratory animals, cell cultures, etc.) must be thoroughly justified in terms of the program guidelines and relevance to U.S. animal agriculture. Multi-disciplinary research is encouraged.**

*Proposals that focus on uterine defense mechanisms (e.g., cell mediated immune responses) or metritis should be directed to the Animal Protection Program (44.0).*

#### **42.0 Animal Growth and Nutrient Utilization**

*Investigators are encouraged to contact Mark Mirando, National Program Leader at (202) 401-4336 regarding questions about suitability of research topics (or at [mmirando@csrees.usda.gov](mailto:mmirando@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, March 16, 2004*

Suboptimal growth and development are limiting factors in animal productivity. Basic information regarding developmental processes in agriculturally important animals, including aquaculture species, is largely lacking. The primary objective of the program is to increase our understanding of the biological mechanisms underlying normal animal growth, development of the musculoskeletal system, lactation, and nutrient digestion and metabolism. New knowledge in these areas is needed to improve animal production and control muscling, growth, metabolism and mammary function. Research is also needed to identify biological mechanisms for increasing dietary nutrient availability, directing nutrient partitioning toward more protein and less fat, enhanced nutrient composition in animal products, and minimizing excretion of endogenous nutrients as waste products.

This program invites both fundamental and mission-linked proposals for innovative research on current major problems related to growth and nutrient utilization in agriculturally important species. Proposals are invited in the following priority areas: (a) improving quality and efficiency of meat production; (b) improving quality and efficiency of milk production; (c) mechanisms controlling nutrient intake, digestion, absorption and availability; (d) microbial ecology and metabolism in the gastrointestinal tract; (e) improving nutrient utilization to minimize excretion of endogenous nutrients as waste products. Research proposals emphasizing functional genomic approaches and other new technologies are encouraged. Proposals that incorporate strategies with immediate application to the animal and/or aquaculture industries are also encouraged.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

**All model systems (especially the use of laboratory animals, cell cultures, etc.) must be thoroughly justified in terms of the program guidelines and relevance to U.S. animal agriculture. Multi-disciplinary research is encouraged.**

*Proposals concerning the developmental biology of the immune system and proposals addressing research on disease agents (biotic or abiotic) should be submitted to the Animal Protection Program (44.0). Proposals focusing on developmental biology of the reproductive system (including embryonic, gonadal, and placental development) and proposals dealing with nutritional regulation of reproduction should be submitted to the Animal Reproduction Program (41.0).*

### **43.0 Animal Genomics**

*Investigators are encouraged to contact Peter Brayton, National Program Leader at (202) 401-4399 regarding questions about suitability of research topics (or at [pbrayton@csrees.usda.gov](mailto:pbrayton@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, June 15, 2004.*

Animal genomics will play an increasingly important role in assuring the continued profitability and competitiveness of U.S. animal agriculture. Identifying, mapping, and understanding the function and control of genes will permit the development of new genetic technologies and increase the ability to realize the full genetic potential for improvement of agriculturally important animal and aquaculture species. The long-term objectives of this program are to increase fundamental knowledge of the composition and organization of the animal genome and to increase the ability to genetically improve agriculturally important animals, including horses and aquaculture species.

Increased knowledge in this area will aid in maintaining the genetic diversity of animals, improving animal productivity and efficiency, matching genetic backgrounds to desired traits, integrating quantitative and molecular genetic information. Also, animal agricultural products may be produced more efficiently and could be of improved quality. For example, genomics research will improve the accuracy of livestock genotype selection for phenotype. In addition, selecting animals with reduced risk for infectious disease thus reducing the need for antibiotics will reduce the induction of antibiotic resistant bacterial strains. A likely integration of disease surveillance and host genetics will emerge for many diseases. Another goal of agricultural research is to promote new markets for agricultural products. High value-added areas, such as production of specialized pharmaceuticals and other biochemical products are emerging industries, and large farm species are increasingly likely to provide models for certain human diseases better than those from genetically modified mice.

Animal genomics research is likely to be cost-effective as a beneficiary of the completed Human Genome Project. The considerable similarities of the genomes of livestock species and even of fish and birds to that of the human will reduce the need for whole genome sequencing, simplify mapping of genes on chromosomes, and allow candidate genes for various economically important traits to be quickly tracked and identified.

Only the specific research areas noted are solicited. Model systems, either biological or economic, must be justified in terms of the program guidelines. Multi-disciplinary research is encouraged.

This program invites both fundamental and mission-linked proposals for innovative research permitting the genetic selection of animals with superior production traits. For FY 2004 proposals are invited in the following priority areas: (a) identification and mapping of molecular markers including quantitative trait loci (QTL) and economic trait loci (ETL); (b) identification of genetic diversity, including single nucleotide polymorphisms, and marker assisted selection with emphasis on those of economic importance, including those associated with genetic defects; and (c) development and application of methods to modify the animal genome (e.g., nuclear transfer, embryonic stem cells and transgenics).

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

The NRI Animal Genomics Program expects that **all** awardees (regardless of subsection) will make the results of research funded by the program publicly available in an appropriate manner (e.g., submission of data to genome databases, sharing probes and sequences, germplasm deposition, or through patent applications). The Animal Genomics Program considers public availability of research results an integral part of the qualifications of the Project Director, which are reviewed as part of the peer review process. Therefore, it is important to include a statement in the proposal regarding how results of

research funded by the Animal Genomics Program have been or will be made publicly available.

*Proposals on emerging biotechnologies for animal reproduction should be submitted to the Animal Reproduction Program (41.0). Proposals on the genetics of animal-associated microbes should be submitted to the Animal Protection (44.0). Proposals on functional genomics should be submitted to the Functional Genomics of Agriculturally Important Organisms Program (45.0).*

### **43.1 Animal Genome Reagent and Tool Development**

*Investigators are encouraged to contact Peter Brayton, National Program Leader at (202) 401-4399 regarding questions about suitability of research topics (or at [pbrayton@csrees.usda.gov](mailto:pbrayton@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of \$1,000,000 for 3 years of support.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, June 15, 2004.*

This section will emphasize the development of basic reagents and tools to accelerate research in agricultural animal genomics. The goal is to develop tools that will advance the understanding of animal genomes in terms of how they are organized and how they function. This will include bioinformatic tools to manage the increasing amount of genomic data being generated. Awards will be made to a laboratory or group of laboratories that will provide such reagents for the use of the scientific community. It is estimated that at least \$3 million will be available during FY 2004 for awards addressing this section that target cattle, swine, sheep, poultry, horses or aquaculture species (or a combination thereof). It is anticipated that awards will be made for three years of support, depending on availability of funds.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: (a) large scale EST (expressed sequence tag) sequencing by using normalized cDNA libraries prepared from tissues expressing genes of economic relevance; (b) production of ordered and arrayed BAC libraries; (c) production of species specific DNA microarrays for gene expression studies (e.g., DNA-based biochips); (d) high resolution physical maps of genes (e.g., radiation hybrid maps); and (e) bioinformatic tools to assist in comparative genomics and annotation.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

Applicants must demonstrate that they can apply the most recent technologies to the production of these reagents and that they will adequately and efficiently store and distribute the reagents and tools once they are available. A description of quality control measures must be included in the proposal. A commitment must be made to make any sequence and mapping data rapidly available by deposition in a publicly accessible database. A clear management plan for coordinating project objectives should be included. Each application must clearly state the area being addressed. If an applicant wishes to address more than one area or more than one animal species, the advantages of such an integrated approach must be described. Applicants for bioinformatic tools should describe how their information will be integrated with existing data/databases

The NRI Animal Genome Reagent and Tool Development Program expects that **all** awardees (regardless of section) will make the results of research funded by the program publicly available in an appropriate manner (e.g., submission of data to genome databases sharing probes and sequences germplasm deposition or through patent applications). The Animal Genome Reagent and Tool Development Program considers public availability of research results an integral part of the qualifications of the investigator, which are reviewed as part of the peer review process. Therefore, it is important to include a statement in the proposal regarding how results of research funded by the Animal Genome Reagent and Tool Development Program have been or will be made publicly available.

*Proposals on emerging biotechnologies for animal reproduction should be submitted to the Animal Reproduction*

Program (41.0). Proposals on the genetics of animal associated microbes should be submitted to the Animal Protection (44.0). Proposals on functional genomics should be submitted to the Functional Genomics of Agriculturally Important Organisms Program (45.0).

#### **44.0 Animal Protection**

For the Animal Disease Countermeasures component, investigators are encouraged to contact Peter Johnson ([pjohnson@csrees.usda.gov](mailto:pjohnson@csrees.usda.gov)), Peter Brayton ([pbrayton@csrees.usda.gov](mailto:pbrayton@csrees.usda.gov)), or Peter Burfening ([pburfening@csrees.usda.gov](mailto:pburfening@csrees.usda.gov)); National Program Leaders at (202) 401-4399 regarding questions about suitability of research topics to arrange a telephone consultation).

For the Animal Well-Being Assessment and Improvement component, investigators are encouraged to contact Peter Burfening, National Program Leader at (202)-401-4399 regarding questions about suitability of research topics (or [pburfening@csrees.usda.gov](mailto:pburfening@csrees.usda.gov) to arrange a telephone consultation )

Standard Research and Integrated project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.

Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004

**IMPORTANT NOTE TO THE ANIMAL HEALTH RESEARCH COMMUNITY:** In response to the National Research Council's evaluation of the NRI and other stakeholder/partner assessments, many NRI programs, including this one, are now evolving to a more issue-based focus. In previous years, this program was known as "Animal Health and Well-Being." In Fiscal Year 2004, the program name has changed, as well as the presentation of research priority areas. Please read the new program description carefully. With limited resources for a very broad area, the program has begun a transition phase to increase award size in fewer areas. During the coming year, the program will be collecting additional input from partners and stakeholders. In Fiscal Year 2005, further focusing of the program is anticipated.

#### **A. ANIMAL DISEASE COUNTERMEASURES**

Maintaining and/or improving animal health to meet the food and fiber needs of this nation is an increasingly difficult challenge. Despite advances in science, new and re-emerging diseases occur with an increasing frequency due to a variety of factors.

The Animal Disease Countermeasures component focuses on high priority diseases of economic importance to U.S. animal agriculture, including horses and aquaculture species. This emphasis will increase the knowledge and technology needed to prevent or reduce the severity of animal diseases. It will also contribute to an increase in the efficiency of animal production systems, a reduction in non-tariff trade barriers, and high-quality safe foods for consumers. The program addresses a major limiting factor in animal agriculture: insufficient basic and applied information about infectious and non-infectious diseases in animals of agricultural importance. This dearth of knowledge seriously impedes a major reduction in costly economic losses from animal diseases that are already present in the United States. The paucity of information also jeopardizes food security and the future viability of animal industries by increasing their vulnerability to pathogens which may establish new niches or undergo genetic mutations to result in new and re-emerging diseases, or which may be accidentally or intentionally introduced.

This area intersects multiple strategic issues within competitive programs. Safeguarding domestic livestock and fish from disease threats directly addresses agricultural and food security. Many project approaches will likely include functional genomics. A number of animal diseases are also threats to human health and their study complements the areas of food safety and human medicine. The role of wildlife in the transmission of some diseases to domestic livestock links some program proposals with natural resources and the environment.

The program supports basic, fundamental discovery research that underpins the long-term and intermediate breakthroughs needed for current and future animal health problems. It also supports applied studies needed for more immediate solutions for current animal disease losses or threats.

*Proposals are expected to address one or more of the following SHORT, INTERMEDIATE, AND/OR LONG-TERM PROGRAM DELIVERY GOALS:*

- Discovery of new foundational knowledge related to pathogen biology, host-pathogen interactions, etiology and control of non-infectious conditions, and/or disease epidemiology and ecology;
- Development of more effective vaccines and adjuvants;
- Improved diagnostic methods/ pathogen detection systems that provide a foundation for a better understanding of disease epidemiology and ecology
- Discovery of innovative disease treatments or preventatives, including immune enhancers, innate immunity stimulation, alternatives to antibiotics, and pathogen inactivation strategies; and,
- Innovative management strategies for prevention and control of animal health problems.

Proposals should indicate in their Project Summary or Project Description which of the program goal(s) they address.

*Proposals are solicited for the following DISEASE/PROBLEM FOCUS AREAS:*

- (1) high priority infectious and non-infectious endemic diseases/conditions; and,
- (2) disease challenges that may be introduced through interactions with wildlife, accidentally (e.g., foreign diseases), or through intentional release.

Pathogens supported by this program include bacteria, virus, prions, protozoa, helminths, external parasites, or fungi that are causative agents of **significant** animal disease (current losses or future threats). It is not likely that funds will be available to support all the high priority diseases/conditions for which proposals will be submitted. Therefore, when justifying the proposal relevance in the Rationale and Significance section of the Project Description, Project Directors are urged to present as convincing a case as possible for that particular disease problem (e.g., evidence of high relevance from stakeholder or partner organizations-websites, support letters; recent economic estimates of loss, etc.).

The Animal Disease Countermeasures Section invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

- (a) PATHOGEN BIOLOGY (e.g., mechanisms of disease, basic cellular and molecular biology, processes critical to infection initiation or disease severity)
- (b) MECHANISMS OF HOST/PATHOGEN INTERACTIONS (e.g., pathogenesis, innate and adaptive immune responses/pathogen clearance, immune modulators)
- (c) NON-INFECTIOUS CONDITIONS (e.g., etiology and control of metabolic and toxicologic diseases, musculoskeletal dysfunction)
- (d) DISEASE EPIDEMIOLOGY AND ECOLOGY (e.g., risk assessment, modeling, economic assessments, molecular epidemiology, environmental factors that compromise animal health, evaluation of management strategies and impact on disease, role of wildlife on disease transmission to livestock).

During the review process, applications that address these section priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

Where appropriate, the program encourages applicants to take advantage of genomic approaches (e.g., functional genomics, proteomics) in order to accelerate the discovery of new targets for diagnostics, vaccines, and treatments. Bioinformatics/data management approaches that link animal pathogen and other related genome databases so that the animal health research community can more readily access, analyze, and use the information are also acceptable. The program supports international efforts to better capture the current and future value of microarray data . If proposing microarray studies, applicants are strongly encouraged to include a statement addressing Minimum Information About Microarray Experiment (MIAME) compliance. For further information about MIAME, see <http://www.mged.org>.

The development and evaluation of diagnostic tests are appropriate when a linkage can be made for their utility in advancing the understanding of the natural history and mechanism of the disease, or its means of transmission or persistence in the host or environment. Proposals that develop new or improved diagnostic tests are expected to include

an appropriate validation plan. Development and testing of diagnostic tests for the sole purpose of disease detection or surveillance is not appropriate for this program and will not be considered.

Vaccine development proposals that may approach or enter the commercialization stage by the conclusion of the award should also address the development of differential assays for detecting vaccinated vs. field exposed animals for newly emerging diseases, or diseases where serology is used to determine exposure/infection. Multi-disciplinary approaches are encouraged.

*For pathogens that affect both animal and human health, if the proposal's primary goal is to safeguard food safety (e.g., reduce the risk of pathogen exposure to humans, rather than protect the animal from disease, proposals should be directed to the Food Safety Program (32.0), or the Epidemiological Approaches for Food Safety Program (32.1). Animal genetics proposals (e.g., proposals with a primary focus on identifying, isolating, and characterizing the genetic basis for disease resistance in the host animal) should be directed to the Animal Genomics Program (43.0). For proposals dealing with the biology of arthropod pests, applicants may also consider the Integrative Biology of Arthropods and Nematodes Program (51.2) or the Arthropod and Nematode Gateway to Biology and Genomics Program (51.3). Applicants should contact the appropriate National Program Leader(s) for further information on the suitability of the proposed research to one of these programs.*

## B. ANIMAL WELL-BEING ASSESSMENT AND IMPROVEMENT

The Animal Well-Being Assessment and Improvement component focuses on enhancing animal well-being throughout the food production cycle. This emphasis will provide information about how animals of agricultural importance in the U.S. interact with the production environment and respond to animal management practices. Where appropriate, improved management practices will be developed that improve animal well-being. Such knowledge is needed to remain competitive globally and to maintain consumer trust through science-based studies. Research to ensure animal well-being may also help decrease animal management and health-care costs. This area addresses agricultural and food security by helping to assure continued access of U.S. animal products to national and international markets.

Both basic and applied research proposals are solicited that contribute to the development of long-term management options and/or short-term production practices that assure animal well-being.

This program invites both fundamental and mission-linked research proposals, as well as proposals that integrate research, education, and/or extension in the following priority areas:

- (a) Develop science-based criteria to measure well-being, including pain, stress, and behavioral needs;
- (b) Determine the impact of current and alternative production systems on animal well-being and food quality, including housing, handling, transportation, and harvest;
- (c) Assess the behavior and well-being of genetically modified food animals.

Multi-disciplinary approaches are encouraged.

During the review process, applications that address these section priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **45.0 Functional Genomics of Agriculturally Important Organisms**

*Applicants are strongly encouraged to contact National Program Leaders with questions about the suitability of proposals. Questions regarding the functional genomics of animals should be directed to Peter Brayton ([pbrayton@csrees.usda.gov](mailto:pbrayton@csrees.usda.gov); telephone: (202) 401-4399). Questions regarding the functional genomics of arthropods and nematodes should be directed to Mary Purcell-Miramontes ([mpurcell@csrees.usda.gov](mailto:mpurcell@csrees.usda.gov); telephone: (202) 401-5168). Questions regarding functional genomics of microbes should be directed to Ann Lichens-Park ([apark@csrees.usda.gov](mailto:apark@csrees.usda.gov);*

telephone: (202) 401-6466). Questions regarding functional genomics of plants should be directed to Ed Kaleikau ([ekaleikau@csrees.usda.gov](mailto:ekaleikau@csrees.usda.gov); telephone: (202) 401-1931).

Standard research project awards for this program are expected to have a total budget (including indirect costs) of \$500,000 to \$1,000,000 for 2-4 years of support. Funds awarded will not exceed \$1,000,000.

Program Deadline: Proposals must be **received by** 5:00 P.M. Eastern Time, June 15, 2004.

Agricultural genomics will play a major role in addressing the challenges facing production and management options for U.S. food and fiber. These challenges include, but are not limited to: increasing crop and animal productivity; developing drought-tolerant crop varieties; enhancing nutritional content and other qualities of food and fiber; creating new food or non-food products or new uses for existing products; mitigating toxin accumulation in the environment; and controlling pests, diseases and other threats to agricultural biosecurity. This program will accept applications primarily for fundamental and mission-linked research, but will also accept proposals for integrated projects.

The goal of the functional genomics program area is to increase the understanding of the biological role of gene sequences in agriculturally important plants, animals, insects, and microbes, and to link these sequences to physiological functions or agricultural and food processes. As the goal of the program is to support large-scale functional analysis of genomic sequences, proposals may include gene expression profiling, proteomics, and/or metabolomics. If proposing microarray studies, applicants are strongly encouraged to include a statement addressing Minimum Information About Microarray Experiment (MIAME) compliance. For further information about MIAME, see [www.mged.org](http://www.mged.org).

Research goals for each of the supported organismal groups are described below. Research using functional genomics to examine interactions between two (2) or more of the four (4) groups of organisms would also be appropriate.

Collaboration with international partners is also appropriate; however, applications must be submitted through eligible U.S. institutions. Grantees will be expected to make the results of research funded by this program area available in a publicly accessible database (e.g., GenBank).

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

**Animals:** Research in this area should focus on tissue-specific gene expression profiling methods (i.e., DNA microarrays, serial analysis of gene expression {SAGE}, differential display, etc.) to identify novel gene products that are temporally expressed in animals used for the production of food and fiber, including horse and aquaculture species. This program primarily seeks fundamental or mission-linked research efforts designed to specifically address gene expression profiling during various stages of animal growth, health/disease, or reproduction. Projects are expected to evaluate the interaction between specific genetic characteristics and the environmental, nutritional, social, or physiological factors that influence the phenotypic expression of characteristics important for animal production or health. The type of tissue, stage of life (embryonic through adult), or breed/type (milk versus meat, layer versus broiler, etc.) should be justified. The proposals are expected to primarily address research topics linking genes with corresponding functions.

**Arthropods and Nematodes :** Research in this area should address gene expression analysis and function of agriculturally important arthropods and nematodes. Organisms will be restricted to crop plant and livestock pests, as well as beneficial or pollinator species. Sequencing projects will be supported only if the project's immediate goal is to ascertain the functions of genes. Model organisms will be considered for support if clear justification is given for how the information gained will be applied to agriculturally relevant species. Topics are limited to: 1) development of cDNA libraries to identify genes of pest management significance; 2) EST-based DNA microarrays for gene discovery; gene replacement, gene tagging, gene suppression, 3) *in vivo* functional analyses, and 4) transposon-mediated transformation.

**Microbes:** Research in this area should address the characterization of the molecular mechanisms responsible for microbial processes, enabled by the availability of a sequenced microbial genome or genomes. Research activities should characterize, on a large scale, the function of genes or networks of genes in microbe(s) having a completely, or

almost completely, sequenced genome. Information (e.g. website URL) necessary to access publicly available genomic sequence data of such microbe(s) should be provided in the Project Description of the application. If the sequence data is not publicly available or there are restrictions on its availability, that should be explained in the Project Description. The microbe(s) of study must be of importance to U.S. agriculture. Projects are expected to utilize microarrays and/or proteomics to 1) analyze the spatial and/or temporal expression of sets of genes and/or proteins or 2) to identify genes expressed or proteins present under different environmental conditions or as part of particular metabolic or regulatory pathways. Research supported in this subsection must fall within one of the following categories: 1) studies of mechanisms of microbial pathogenicity, 2) studies of microbial mechanisms of host specificity and colonization 3) studies of mechanisms of microbe-microbe or microbe-host communication and 4) studies of microbial mechanisms of surviving, or responding to, environmental changes. Applicants submitting proposals involving the development of microarrays are encouraged to include plans for distributing the arrays as a community resource. This sub-section **will not** support whole genome sequencing of microbes. Such studies should be submitted to the NSF/USDA Microbial Genome Sequencing Program (MGSP). For more information, the MGSP program announcement can be viewed at: [www.reeusda.gov/1700/funding/04/rfa\\_microbial\\_04.htm](http://www.reeusda.gov/1700/funding/04/rfa_microbial_04.htm).

**Plants:** Research in this area is expected to focus on the completed sequence of the rice genome as a reference species for cereals. Examples of research include comparative functional genomic analysis including proteomics and metabolomics to associate sequence information to biological function for U.S. crop improvement in rice, wheat, barley, corn and sorghum. Recognizing the considerable rice genomics resources developed internationally, applicants are encouraged to develop proposals that build or expand U.S. collaboration with the international community on rice functional genomics. For further information see <http://www.iris.irri.org/IRFGC/>.

## **51.2 Integrative Biology of Arthropods and Nematodes**

*Investigators are encouraged to contact Mary Purcell-Miramontes, National Program Leader, at (202) 401-5114 regarding questions about suitability of research topics (or [mpurcell@csrees.usda.gov](mailto:mpurcell@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004.*

Fundamental knowledge is needed to form the basis of novel management strategies for pests and lead to better utilization of beneficial species. In addition, elucidating the phylogenetic relationships of agriculturally important arthropods and nematodes will enable reliable species identification, which is essential for effective management of pests. The long term objective of this program is to improve pest management options for the future and to reduce our dependence on pesticides that are harmful to the environment. Emphasis is placed on ecological studies of insects, mites, ticks or nematodes with plants or animals of agricultural importance. The systems under study can include pests occurring in horticultural and field crops, forests, rangelands, urban landscapes, food or feed transported and stored for human or livestock consumption, and arthropod pests of livestock. The term pest is limited to insects, mites, ticks, plant parasitic nematodes and weeds (only within the context of biological control of weeds and where the focus is on arthropod biological control agent). Beneficial species include insect pollinators and biological control agents (e.g., insects, microbes and entomopathogenic nematodes) of the above pests.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: 1) population biology, 2) biological control, 3) chemical ecology, 4) behavioral ecology, and 5) fundamental resistance management studies (proposals on this topic must show how results will be applied to development of resistance management programs).

Priority will be given to projects that demonstrate relevance to U.S. agriculture. Model organisms will be considered for support only if clear justification is given for how information gained will be applied to agriculturally relevant species. Proposed studies must include a justification for how anticipated results will be relevant to reduced stress on plants or livestock. Proposals that include a modeling component must give consideration to validation of the model. Proposals

whose sole purpose is to develop diagnostic tests for pest detection or surveillance are not appropriate for this program and will not be considered.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*Proposals for research focusing on molecular genetics, biochemistry or physiology of insects, mites, ticks and nematodes should be submitted to the Arthropod and Nematode Gateways to Genomics program (51.3). Studies assessing or managing the environmental risk of introducing genetically modified organisms into the environment should consider submitting to the USDA Biotechnology Risk Assessment Research Grants Program (<http://www.reeusda.gov/crgam/biotechrisk.biotech.html>). Applicants are directed to other pest management grant programs in CSREES such as Crops at Risk (CAR), Risk Avoidance and Mitigation Program (RAMP), Methyl Bromide Transitions (MBT), Organic Transitions (ORG) for more near-term studies in pest management*

### **51.3 Arthropod and Nematode Gateways to Genomics**

*Investigators are encouraged to contact Mary Purcell-Miramontes, National Program Leader at (202) 401-5114 regarding questions about suitability of research topics (or at [mpurcell@csrees.usda.gov](mailto:mpurcell@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004.*

Advances in the molecular physiology, biochemistry, and genetics of arthropods and nematodes could lead to environmentally sustainable pest management options in the future. Examples of promising outcomes include the identification of gene products which relate to corresponding resistance genes in plants and animals, molecular genetic analyses of host-pathogen or host-parasite interactions to promote environmentally benign methods of pest control, incorporation of arthropod-specific neurotoxins into vectors such as baculoviruses to increase their potency, identification of genes that code for resistance to insecticides or to pests of pollinators, analysis of genes for selective improvement of beneficial insects, such as olfaction, pollination, and nectar-gathering activity or genes relevant to insecticide targets, immunity of insects to pests and pathogens, pheromone biology, feeding, reproduction, and mating behavior. Priority will be given to projects that demonstrate relevance to U.S. agriculture. Model organisms will be considered for support only if clear justification is given for how information gained will be applied to agriculturally relevant species. Projects should be hypothesis-driven and aimed to better understand molecular physiological, biochemical or genomic processes in agriculturally important arthropods and nematodes. Arthropods in this program are limited to insects, mites and ticks. Nematodes include both entomopathogenic and plant-parasitic nematodes.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: 1) molecular characterization of signaling pathways between arthropods or nematodes and their hosts; 2) cellular and molecular basis of interactions of arthropods or nematodes with plant resistance genes, plant defensive compounds, pheromones or semiochemicals; 3) cellular and molecular studies of arthropod or nematode interactions with microbes; 4) genetic manipulations to evaluate the function of arthropod or nematode genes, and 5) characterization of novel targets for pest control, including pesticide resistance studies.

Proposed studies must include a justification for how anticipated results will lead to improvement of future pest management strategies for U.S. commodities. Proposals whose sole purpose is to develop diagnostic tests for pest detection or surveillance are not appropriate for this program and will not be considered. However, these studies are appropriate if a direct linkage can be made for their utility in advancing knowledge of arthropod or nematode biology and genomics.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been

listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*Proposals for research focusing on ecology and behavior of arthropods and nematodes should be submitted to the Integrative Biology of Arthropods and Nematodes Program (51.2).*

### **51.8 Biology of Plant-Microbe Associations**

*Investigators are encouraged to contact Ann Lichens-Park, National Program Leader at (202) 401-6466 regarding questions about suitability of research topics (or at [apark@csrees.usda.gov](mailto:apark@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004.*

Microbes play critically important roles in agricultural systems, both as pathogens and as beneficial organisms. This program will support fundamental and mission-linked research on interactions between plants and their associated microbes, including fungi and fungal-like microbes, bacteria, viruses, viroids, and mycoplasma-like organisms. Studies on the biology of the microbes themselves, the interactions between the microbes and plants, the response of plants to microbes and the influence of biotic and abiotic environmental factors on plant-microbe interactions are within the scope of this program. Microbes studied may be foliar or soil-borne, free-living or living within plant hosts. Microbes and their interactions with plants may be examined at the biochemical, genetic, cellular, organismal and/or population levels. Microbial functional genomic studies are also encouraged. Applicants submitting proposals involving the development of microarrays are encouraged to include plans for distributing the arrays as a community resource.

Studies should lead to a broad base of knowledge and should advance the conceptual framework of plant pathology, plant microbiology, or related fields. This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: 1) disease or resistance interactions between microbial pathogens and their host plants. Such studies may focus on the pathogen, the host plant or both; 2) interactions between microbes and their plant hosts which positively influence plant productivity (e.g. microbial biocontrol agents, nitrogen-fixing bacteria, or fungal endosymbionts of plants.); 3) processes affecting the growth, reproduction, survival or spread of microbes that negatively or positively affect plant productivity and the influence of environmental factors on such processes; 4) epidemiological studies which address spread and invasion of plant-associated microbes.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

The development and evaluation of diagnostic tests are appropriate when a direct and persuasive linkage can be made for their utility in advancing the understanding of mechanisms underlying plant disease, or its means of transmission or persistence in the host or environment. Development and testing of diagnostic tests simply for the purpose of disease detection or surveillance is not appropriate for this program and will not be considered.

*Proposals addressing nitrogen metabolism in microbes should be submitted to the Biochemistry of Plants and Plant Symbionts Program (54.3). Proposals focusing on how microbial processes affect the soil environment and how the soil environment affects the microbial interaction with the plant should be submitted to the Soils and Soil Biology Program (25.0).*

### **51.9 Biology of Weedy and Invasive Plants**

*Investigators are encouraged to contact Diana Jerkins, National Program Leader at (202) 401-6996 regarding questions about suitability of research topics (or at [djerkins@csrees.usda.gov](mailto:djerkins@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 23, 2004.*

Weedy and invasive plants cost Americans well over \$1 billion annually in damage and lost earnings. The presence of weedy or invasive plants in croplands reduces crop yields through competition for resources, and may contaminate grain for export. In other ecosystems, weedy or invasive plants may out compete native species, and change the ecosystem in fundamental ways.

The goal of this program is to support: 1) research on general processes and principles that contribute to plant competitiveness or invasiveness, or 2) development of novel methods to alter plant species competitiveness, invasiveness, or abundance. It is expected that the knowledge gained from these studies will ultimately be applied to agricultural settings or closely related systems involving weedy or invasive plants. This program also invites proposals for projects that integrate research, extension, and/or education to address novel and environmentally sound forms of controlling weedy or invasive plants (see priority “(a) and “(d)” below). The NRI will use no more than 20% of available funds to support integrated projects; these funds will not be distributed uniformly across all NRI programs.

The program will entertain proposals aimed at characterizing and understanding the population dynamics of weeds and their interactions with plant and animal populations in agricultural settings (emphasizing crop production, range and pasture production and forest production), wild lands and lands of conservation significance. Supported studies will focus on native or exotic plant species that are considered to be weedy or invasive. Studies on plant traits that may contribute to weediness or invasiveness using model systems are also welcome, if the results will directly enhance our understanding of more serious weeds. Collaborations between weed biologists and plant population biologists, ecologists, physiologists, systematists, or those with expertise in simulation modeling are encouraged

Research on the following topics is solicited:

- (a) development of methods to rapidly assess the probability that a plant may become weedy or invasive in a new environment;
- (b) understanding how and to what extent weedy or invasive species affect crops, pastures, rangelands or native biodiversity;
- (c) understanding ecological, physiological, evolutionary, or genetic processes that contribute to plant invasiveness or ecological success;
- (d) development of new principles and techniques that will lead to novel and environmentally sound forms of controlling weedy or invasive plants.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

*Proposals that address how the interaction between weeds and native plants affect the structure and function of forests, rangelands, agricultural, and aquatic ecosystems should consider submitting to the Managed Ecosystems Program (23.1).*

## **52.1 Plant Genome, Bioinformatics, and Genetic Resources**

*Investigators are encouraged to contact Ed Kaleikau, National Program Leader at (202) 401-1931 regarding questions about suitability of research topics (or at [ekaleikau@csrees.usda.gov](mailto:ekaleikau@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M. Eastern Time, January 9, 2004..*

The NRI Plant Genome Program will support small-scale research projects that advance our knowledge of the genome structure, organization and function of plant species important to U.S. agriculture or forestry. The program also supports projects on the application of basic discovery to plant improvement that can result in new products or new trade markets important to U.S. agricultural producers and consumers. Investigators are encouraged to develop national and international collaborations with research groups already working on the species of interest to minimize duplication of effort and maximize cost effectiveness. Proposals that include interaction and cooperation with end user groups such as the seed industry, processors and growers that have already made a significant investment in the species of interest are encouraged. Proposals should include a plan for timely dissemination of information and deliverables to a clearly identified community of users as well as to the scientific community as a whole. Proposals must aim to release the results of their research to the public in a timely manner and in an accessible and usable form. Proposals from both individual investigators and multi-disciplinary groups are encouraged.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

- Use of innovative approaches for plant functional genomics research, comparative studies and QTL analysis.
- Application of marker-assisted breeding/selection to characterize germplasm, establish mapping populations, and utilize new genome technologies to identify and transfer genes critical to U.S. plant breeding objectives.
- Meeting plant bioinformatic and data management needs to efficiently and effectively handle and interpret the increasing amounts of genomic / genetic data being generated.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

## **52.2 Genetic Processes and Mechanisms of Crop Plants**

*Investigators are encouraged to contact Liang-Shiou Lin, National Program Leader at (202) 401-5042 regarding questions about suitability of research topics (or at [llin@csrees.usda.gov](mailto:llin@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004.*

Basic understanding of plant genes and genetic processes and mechanisms is crucial for the genetic improvement of agricultural plants. The goal of this program is to supply such fundamental knowledge to support the development of genetically superior varieties of crop and forest species. This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: (a) functional analysis of agriculturally important genes and gene products; (b) regulatory mechanisms of expression of nuclear and organellar genes including all stages from transcription to post-translational modification; (c) mechanisms of recombination, transposition, replication, and repair; (d) epigenetic mechanisms that influence gene expression, including studies on polyploidy, gene dosage, and gene

duplication; and (e) genetics processes at the level of plant population and plant evolution, including studies on plant domestication.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

While model systems may be appropriate for some of these studies, investigators are encouraged to study these processes directly in a crop or forest species important to agriculture, or to apply basic knowledge gained from model systems to the improvement of agricultural plants.

#### **52.4 Applied Plant Genomics – Coordinated Agricultural Project (CAP)**

*Investigators are encouraged to contact Ed Kaleikau, National Program Leader at (202) 401-1931 regarding questions about suitability of research topics (or at [ekaleikau@csrees.usda.gov](mailto:ekaleikau@csrees.usda.gov) to arrange a telephone consultation).*

*A CAP award is not likely to exceed a total budget (including indirect costs) of \$5 million for a period of time not to exceed 4 years. The program anticipates making only 1 award as a continuation grant (see Part II Section C). This **program is not accepting proposals** for Agricultural Research Enhancement Awards, including Postdoctoral Fellowships, New Investigator Awards, and Strengthening Awards which include Research Career Enhancement Awards, Equipment Grants, and Seed Grants; and Strengthening Standard Research Project Awards.*

*Program Deadline: Proposals must be **received by** 5:00 P.M. Eastern Time, March 16, 2004.*

##### *Letters of Intent:*

*While not required, it is requested that applicants notify CSREES of their intent to submit applications by emailing letters of intent to Ed Kaleikau, National Program Leader ([ekaleikau@csrees.usda.gov](mailto:ekaleikau@csrees.usda.gov)) by COB on February 15, 2004. The letter should contain: (1) a descriptive title of the proposed project; (2) names and roles of the PD(s) and other key personnel, along with their institutions; and (3) a brief statement of approaches and objectives (500 words or less). CSREES may not provide applicants with feedback regarding the content of these letters. Failure to submit a letter of intent will not preclude consideration of an application.*

***This new emphasis area will support one proposal of \$4 – 5 million for USDA’s Applied Plant Genomics Initiative (APGI).*** *The goal of the APGI is to engage the applied plant-science communities, both public and private, and involve them in the application of basic discoveries to U.S. crop or forestry improvement. The APGI intends to concentrate applied genomic research on a single crop or forestry species each fiscal year rather than moderate investments in many plant species. This year the APGI will provide support for a CAP award **focused on large-scale rice translational genomics for U.S. agriculture.** In subsequent years, the APGI anticipates focusing support on a different plant or plants (e.g. wheat, barley, soybean, cotton, loblolly pine, Compositae, Solanaceae, etc.).*

*In 1999, USDA’s Cooperative State Research, Education and Extension Service in partnership with the NSF and DOE, competitively funded U.S. laboratories to participate in the International Rice Genome Sequencing Project (IRGSP). For additional information see the U.S. Rice Genome Sequencing website at <http://www.usricegenome.org/>. In December 2002, the IRGSP completed a high quality draft sequence of the rice genome and they are on target to complete a fully annotated sequence in 2004. By leveraging the knowledge from the rice sequence and investments in rice functional genomics and bioinformatics the stage is set for a large-scale U.S. rice applied genomics project.*

*The APGI anticipates making only one award this year to a multi-disciplinary, multi-institutional, and multi-state team. In an award’s final year, Project Directors may request a supplement contingent on the demonstration of superior accomplishments, the identification of additional opportunity areas for translational genomics, and the availability of program funds.*

*To facilitate community planning for large-scale applied plant genomic projects and to bridge the gap between genome researchers and plant breeders -- potential applicants for a CAP award in subsequent years are encouraged to submit a research conference proposal this year focused on bringing together a community of plant breeders, genome scientists,*

*end-users, growers, and other experts to identify research needs, update information, and to advance translational genomics research in wheat, barley, soybean, cotton, loblolly pine, Compositae, Solanaceae, etc.. Up to \$12,000 can be requested for a research conference planning proposal and must be received by 5:00 P.M. Eastern Time, March 15, 2004. For more information see Part II A.(b) and; Part III B. 2. (b).*

The Applied Plant Genomics Initiative (APGI) is a mission-oriented, targeted emphasis area, the goals of which are to foster and coordinate research to identify, characterize, alter, and rapidly and precisely manipulate genes that control plant traits important to the productivity and sustainability of the U.S. agricultural enterprise. To accomplish this goal, the APGI is seeking proposals that are of high potential applicability to the understanding and improvement of agriculturally important plants. Interaction and cooperation with end user groups (e.g. seed industry, processors, growers, etc.) is encouraged.

The intent of the APGI is to promote collaboration, open communication, the exchange of information and the development of resources that accelerate application of basic discovery in plant genomics to crop improvement. The APGI aims to reduce duplication of effort, and integrate activities among individuals, institutions, states, and regions. Therefore, proposals should clearly articulate how a CAP award will complement and/or link with existing programs or projects.

Unit participants would serve as a team that would be able to conduct targeted research in response to an emerging or priority area(s) for plants important to U.S. agriculture. This research unit would contain expertise in breeding, cereal genomics, genetic resources, bioinformatics, plant biology, as well as expertise from principal stakeholders and partners. The proposal should outline the potential of this unit, its structure, coordination, plan of implementation and propose several research areas that will be evaluated during the study period.

The aim of the CAP award is to encourage maximum flexibility in applied plant genomics research. Proposals will be evaluated based on how well their goals and objectives respond to current needs using genomic tools and resources. It is recognized however, that as an award's comprehensive approach unfolds, unexpected advances and promising leads, or unforeseen new national needs related to project goals and objectives, may be identified. The project team members are expected to be capable of responding to these opportunities. As a result, there is an expectation that objectives may be redirected and /or new objectives may be developed (with associated budget adjustments). To encourage flexibility, the program does not expect that all investigators associated with the proposed project will be supported throughout its duration. It is suggested that investigators involved in shorter-term, specific tasks be supported through a series of renewable subcontracts. In their original budgets, applicants may request that no more than 25% of the requested funds be available to accomplish time-critical objectives of national interest that they will determine at a later date. With the approval of the Authorized Departmental Officer, grantees may shift resources to allow additional subcontracts.

Project Directors should plan to present an annual progress report to principal stakeholders (e.g., in conjunction with national grower meetings, workshops, or conferences). At the conclusion of the CAP award, the team must present a final report to the principal stakeholders in order to assure widespread dissemination and implementation of the accomplishments. If a CAP is funded, beginning in the second year of funding, at least one member of the CAP will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the CAP budget.

Proposals are expected to propose coherent, complementary research activities with the ultimate goal of being a National strategy or solution that could be implemented for U.S. agricultural plant improvement. Proposals are expected to take advantage of recent advances in genomics and to translate basic discoveries and knowledge to practical application. Comprehensive approaches are expected to include coordinated work on several of the following areas: development and implementation of easy-to-use molecular markers for breeding, establishment of mapping populations, utilization of functional genomic tools, resources and knowledge, capacity for identifying genomic intervals that carry genetic traits of interest (e.g. yield, quality, pest resistance, stress tolerance, etc), implementation of informatics-based tools for breeding, support for a U.S genetics resource center and effective communication of genomics to all segments of the population such as end – users, producers, growers, farmers, scientists and the lay public.

During the review process, applications that address the stated program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. Irrespective of the topic or

approach, all applications should include in the proposed budget sufficient funds to support the presentation of progress and successes as part of the NRI's post-award management efforts.

**In a SINGLE PROPOSAL, rice translational genomic projects are requested that incorporate the following:**

- Develop or improve fine structure genetic and physical maps etc, establish mapping populations, and identify genomic intervals that carry traits of agronomic interest that are directly useful to breeders and to other biologists for fundamental plant science research. A proposal may include production of localized or total-genome maps that will be useful in improvement or in cloning genes of agricultural importance. The proposal should clearly justify the nature of the map to be constructed (e.g. genetic, physical or comparative; high density or low density). Proposals must include an assessment of the present state of the genome map, the availability of existing genetic materials and technologies, the rationale for choice of the mapping population, genotype or breeding line, and the short and long-term applications of the map for plant breeding or other research and;
- Develop or improve informatics-based tools that translate basic discovery for U.S. agricultural plant improvement. The proposal should focus on: (1) providing bioinformatics training opportunities that foster a collaborative interface between breeders, biologists, computational scientists, and end users; (2) the improvement of statistical, and computational methods for analyzing genomic / genetic data critical for plant breeding objectives that include controlled vocabularies; (3) the improvement of resources for the acquisition, management, storage, and; interoperability of genome / genetic data that can incorporate increasingly diverse information for plant improvement; (4) the enhancement of tools for analysis of plant genome sequence data including quantitative and graphical representation of germplasm relatedness, comparison of data across species and QTL analysis; (5) the improvement of resource web pages for specific classes of traits, proteins, genes, or metabolic pathways for plant improvement and;
- Develop or improve molecular markers and apply marker-assisted breeding/selection to characterize germplasm critical to U.S. plant breeding objectives or which will create new products or new markets for the U.S. agricultural industry. Support will be provided for investigators to utilize new genome technologies to address problems not readily solved by conventional breeding methods. The program will support projects to locate, identify and isolate genes that are important to the productivity and sustainability of agriculture. To prevent duplication of effort, applicants are strongly encouraged to use the available genomic tools and resources, such as existing genomic maps, cytogenetic stocks, alien addition lines, near isogenic lines, mutants, transposons, molecular markers or other existing information and technologies to locate, identify and isolate genes that have potential value to U.S. agriculture and;
- Include a plan for timely dissemination of information, mapping data, and materials to a clearly identified community of users as well as to the scientific community as a whole. As such, support for a U.S. public stock center where genetic resources can be deposited, maintained, retrieved, and distributed is requested. Before developing a proposal, applicants are strongly encouraged to study and consider the issues outlined in the Report on the Workshop on Establishing a U.S. Rice Resource Center at [http://www.gramene.org/misc/Rice\\_Workshop\\_Report\\_Feb\\_18\\_2\\_1.pdf](http://www.gramene.org/misc/Rice_Workshop_Report_Feb_18_2_1.pdf) A plan for continued maintenance and operation of such a service beyond the requested award period, without assuming long-term NRI support, must be included in the proposal and;
- Address issues related to the societal impact of plant genome research that may hinder capacity to utilize genomics to improve the efficiency, profitability and sustainability of U.S. agricultural production and;
- Include an advisory group with principal stakeholders and partners and a plan for how that group could function effectively to support the goals and objectives of the CAP and;
- Complement and/or link with already existing programs or projects to include multi-disciplinary, multi-institutional, and multi-state involvement and;
- Effectively communicate understanding of applied plant genomics to all segments of society.

### **53.0 Developmental Processes of Crop Plants**

*Investigators are encouraged to contact Liang-Shiou Lin, National Program Leader at (202) 401-5042 regarding questions about suitability of research topics (or at [llin@csrees.usda.gov](mailto:llin@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004.*

The goal of this program is to provide fundamental knowledge on plant growth and development over various phases of the plant life cycle, from seed to seed. Such knowledge forms the basis for improving crop plants through modification of plant growth patterns or developmental processes. This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas: (a) regulation of the cell cycle and mechanisms of cell division, expansion, and differentiation; (b) developmental pathways leading to the formation of vegetative and reproductive structures; (c) hormonal regulation of growth and development; (d) mechanisms of transducing internal and external signals required for normal growth and development; and (e) cellular structures or cell biological processes that affect plant growth or development, such as studies on the cytoskeleton, membrane transport, and macromolecular trafficking.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

Researchers are encouraged to study these processes directly in a crop or forest species important to agriculture. Use of model systems is appropriate if tools are not yet available in the crop species of interest; however, the investigator must address agricultural application of such studies.

### **54.3 Biochemistry of Plants and Plant Symbionts**

*Investigators are encouraged to contact Gail McLean, National Program Leader at (202) 401-6060 regarding questions about suitability of research topics (or at [gmclean@csrees.usda.gov](mailto:gmclean@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004.*

For plant genomics to lead to development of plants with improved or optimized performance, the function of genes in biochemical processes and pathways in the cell as well as the biochemical processes and pathways themselves need to be characterized. Indeed, the lack of knowledge about a biochemical pathway or process is often the rate-limiting step for application of the genomic and genetic information. Thus, the combination of biochemistry and genomics will play an important role in the improvement and sustainability of agricultural and food production systems.

The goal of this program is to provide basic knowledge about biochemical processes, pathways, and interactions in plants and plant symbionts. The resulting fundamental knowledge in biochemistry, combined with genomics and molecular biology, will lead to practical applications such as improving the nutritional value of plant-based foods, increasing productivity of crop plants, enhancing plant fitness and survival, and utilizing plants as bioreactors to produce important industrial and pharmaceutical compounds.

Research for this program should either focus on a biochemical process in plants and plant symbionts (e.g., nitrogen-fixing bacteria, mycorrhizal fungi) or address a problem in plant biology using predominantly a biochemical approach. The research problem should be relevant to agriculture, and the use of any model experimental systems should be justified relative to the long-term objectives of U.S. agriculture. This program invites both fundamental and mission-linked

proposals for innovative research in the following priority areas: (a) Photosynthesis and respiration in plants or free living photosynthetic microbes; for example, bioenergetics such as primary electron transfer reactions and biochemical studies of photosystems I and II; (b) Nitrogen fixation and metabolism in plants and free-living nitrogen-fixing microbes; for example, structure-function studies of nitrogenase and biochemical analysis of nitrogen fixation, including uptake, transport, and accumulation of nitrogen; (c) Primary and secondary metabolites and metabolic pathways; for example, carbon/nitrogen partitioning and identification of key regulatory steps; (d) Cell wall structure and enzymology; (e) Small scale proteomic or metabolomic studies to gain insight into biological systems.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

## **61.0 Markets and Trade**

*Investigators are encouraged to contact Patricia C. Hipple, National Program Leader at (202) 401-2185 regarding questions about suitability of research topics (or at [hipple@csrees.usda.gov](mailto:hipple@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Applications must be **received by** 5:00 P.M. Eastern Time January 23, 2004.*

This program invites both fundamental and mission-linked proposals for innovative research in four priority areas. Proposals are invited that strive to better understand:

1. The forces that affect competitiveness and sustainability of U.S. food, fiber, and bio-based products in domestic and/or international markets
2. The implications of globalization for U.S. food, fiber, and bio-based products and the agricultural and rural sectors
3. The implications of U.S. and world trade policy, regulation, and practices for U.S. food, fiber, and bio-based products and the agricultural and rural sectors
4. The effects of macroeconomic policy, industry structure and business behavior, and changing consumer behavior on U.S. food, fiber, and bio-based products and the agricultural and rural sectors.

Proposals are invited from any social or behavioral science discipline or combination thereof. A wide range of theoretical and methodological approaches is welcome, but applicants are strongly advised to specify their theory and methods on a level that a multi-disciplinary review panel will understand. Evaluation premiums are earned by proposals that present a new, creative, and innovative perspective or approach to a timely and important topic, that explain the unique contribution the research will make to our understanding of the research question, that discuss the broader impacts of the research, and that provide a persuasive argument why federal funding should be used to support this research. The “experimental plan” required in the application must include a discussion of the literature, hypotheses and/or research questions, the research design and methods, rationale for and description of the planned sample or secondary data, expected research outcomes or results, and a dissemination plan for the results.

If a project is funded at least one member of each project team will be required to attend annual investigator meetings beginning in the second year of funding. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

## **62.0 Rural Development**

*Investigators are encouraged to contact Patricia C. Hipple, National Program Leader, at (202) 401-2185 regarding questions about suitability of research topics (or at [hipple@csrees.usda.gov](mailto:hipple@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Applications must be **received by** 5:00 P.M. Eastern Time, January 23, 2004.*

This program invites both fundamental and mission-linked proposals for innovative research in four priority areas. areas:

1. The forces and opportunities that affect rural places and the people who live there
2. The implications of globalization for rural community viability and prosperity
3. The consequences of structural changes in agriculture and their affect on rural communities and landscapes
4. The rural development potential of agricultural and non-agricultural rural entrepreneurship

The program also invites proposals that integrate research, education and/or extension to address the rural development potential of agricultural and non-agricultural rural entrepreneurship (see priority (d) above). The NRI will use no more than 20% of available funds to support integrated projects; these funds will not be distributed uniformly across all NRI programs.

Proposals are invited from any social or behavioral science discipline or combination thereof. A wide range of theoretical and methodological approaches is welcome, but applicants are strongly advised to specify their theory and methods on a level that a multi-disciplinary review panel will understand. Evaluation premiums are earned by proposals that present a new, creative, and innovative perspective or approach to a timely and important topic, that explain the unique contribution the research will make to our understanding of the research question, that discuss the broader impacts of the research, and that provide a persuasive argument why federal funding should be used to support this research. The “experimental plan” required in the application must include a discussion of the literature, hypotheses and/or research questions, the research design and methods, rationale for and description of the planned sample or secondary data, expected research outcomes or results, and a dissemination plan for the results.

If a project is funded at least one member of each project team will be required to attend annual investigator meetings beginning in the second year of funding. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **71.1 Improving Food Quality**

*Investigators are encouraged to contact the National Program Leaders, Hongda Chen at (202) 401-6497 or Ram Rao at (202) 401-6010 regarding questions about suitability of research topics (or e-mail them at [hchen@csrees.usda.gov](mailto:hchen@csrees.usda.gov) or [r Rao@csrees.usda.gov](mailto:r Rao@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research or Integrated project awards for this program are not likely to exceed a total budget (including indirect costs) of \$300,000 to \$500,000 for 3-4 years of support.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 23, 2004*

Food product development is driven by the consumer needs and the global market. Increased demand for better food quality and international competition calls for a greater understanding and application of physical, chemical and biological principles that govern food product formulation and quality. Food quality is broadly defined to include the aspects such as nutritional value, healthful implication, palatability, and convenience. The primary objective of this program is to provide federal financial support to expand the scientific and engineering knowledge matrix that aids the development of highly nutritious, performance enhancing, and affordable foods that exhibit superior sensory attributes.

Research projects supported in this program for FY 2004 will focus on the following three areas: (a) fundamental understanding of the relationship between the structure and function of the food components and functionality in food systems affected by the interactions of constituents, processes, and packaging; (b)

advanced and innovative processing engineering and technology that enhance food quality attributes, including development and applications of analytical characterization techniques of physical, chemical, biological, and sensory natures; and (c) the fates of bioactive compounds and nutrients in health-promoting or disease-preventing foods and food ingredients during processing, storage and distribution. Multi- and cross-disciplinary approach is highly encouraged. For integrated projects, the focus for FY 2004 will be on the development and technology transfer of promising emerging food processing technologies that can greatly enhance the capability of improving food quality, safety, convenience, and market competitiveness. Industrial matching funding is highly encouraged.

During the review process, applications that address these program priorities will be given higher priority for funding. Research projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV. B. 13. a).

We anticipate that this program will have two sections, namely (A) Food Engineering and Physical Processes; and (B) Food Chemistry and Product Development; with a separate panel for each due to the large number of proposals expected. The researchers are encouraged to indicate their preference of the review panel. If not indicated, the proposal will be assigned based on the collective decision of the Program Directors and the Panel Managers.

*Proposals dealing with issues of food safety should be directed to the Food Safety Program (32.0). Proposals dealing with food consumption, production, or preparation that focus on human diet and nutrition issues or those seeking to establish or substantiate health benefits of foods or food components should be sent to the Improving Human Nutrition for Optimal Health Program (31.0). Proposals dealing with consumer attitudes and behavior towards food should be submitted to the Human Nutrition and Obesity Program (220.1).*

## **71.2 Biobased Products and Bioenergy Production Research**

*Investigators are encouraged to contact Chavonda Jacobs-Young, National Program Leader at (202) 401-6188 regarding questions about suitability of research topics (or at [cjacobs@csrees.usda.gov](mailto:cjacobs@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, January 9, 2004*

Agricultural commodities can provide raw materials for the production of numerous industrial and consumer products such as enzymes, textile fibers, coatings, paper and packaging materials, construction materials and composites, personal care products, biocontrol agents, and pharmaceuticals. In addition, agricultural biomass is a plentiful source of fuels that can lessen U.S. dependence on foreign energy supplies. Use of agricultural biomaterials for fuels or products provides a renewable alternative to petroleum-based feedstocks along with the potential for reduced emissions and by-products and improved biodegradability of end products.

Federal policy supports greater use of biobased products and research on biomass processing and conversion. This program area supports fulfillment of Executive Order 13134 (*Developing and Promoting Biobased Products and Bioenergy*), which calls for a tripling of U.S. use of biobased products by 2010 and the *Biomass Research and Development Act of 2000*, which promotes research and development leading to the production of biobased industrial products.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

**Biobased industrial and consumer products.** Research is needed on improved methods for producing existing products and on developing new uses for agricultural commodities. Knowledge is needed in the areas of: (a) fundamental studies of plant and animal structures/properties to enhance product quality and processing characteristics; (b) physical, chemical, and biological modifications of plant and animal materials to aid in the development of high-value products; (c) improved production technology, including separation, extraction, and concentration processes; (d) biochemical and chemical catalysis; (e) improved methods for measuring and controlling process parameters; and (f) new (non-food) uses for under-utilized co-products and residuals from agricultural and food processing operations.

Examples of research to be supported include: (a) development of chemicals and materials such as adhesives, adsorbents, coatings, detergents and surfactants, films, foams, lubricants, organic acids, polymers (biodegradable polymers, engineering plastics, copolymers, polymer blends and networks), specialty fibers, textiles (geotextiles and biomedical materials), and fiber-reinforced composites; (b) research on improved process technology such as raw material preparation, chemical and bioconversions, electrotechnologies, methods for processing agricultural co-products (e.g., leather, food processing and crop residues, etc.), and conventional unit operations; and (c) utilization research including end-use development and biodegradation studies.

**Biofuels research.** Proposals will be considered for fundamental and mission-linked research relating to the conversion of biomass material to alcohol fuels and biodiesel. The scope of the program includes pretreatment and conversion steps that limit the technical and economic efficiency of biological production of fuels from agricultural and forest biomass. This program area emphasizes the biological (including microbiological) processes central to the conversion process, including physiological, biochemical, and genetic factors. Biodiesel research is limited to crop improvement related to biodiesel properties and to conversion technology. **Engine performance testing and emissions characterization will not be supported.**

Problem areas for investigation include: (a) fundamental biology/metabolism/ genetics of fuel-producing organisms; (b) pretreatment and degradation of lignocellulose; (c) structure and activity of enzymes of cell wall degradation as related to biofuel production; (d) pentose transport and metabolism; and (e) investigations of novel substrates in relation to conversion to biofuels.

During the review process, applications that address the above program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **73.0 Improved Utilization of Wood and Wood Fiber**

*Investigators are encouraged to contact Chavonda Jacobs-Young, National Program Leader at (202) 401-6188 regarding questions about suitability of research topics (or at [cjacobs@csrees.usda.gov](mailto:cjacobs@csrees.usda.gov) to arrange a telephone consultation).*

*Standard Research project awards for this program are expected to have a total budget (including indirect costs) of no less than \$300,000 and no more than \$500,000 for 2-4 years of support. Funds awarded will not exceed \$500,000.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, February 18, 2004.*

Current federal initiatives to reduce forest wildfires include the creation of healthy forests through the thinning of undergrowth and trees on nearly 20 million acres of federal lands. Value-added uses for these forest thinnings and other wood based materials must be identified. This program encourages research on critical barriers to enhance the utilization of wood and wood fiber. The program will place emphasis on projects leading to the development of value added wood based products which will improve the competitive value and quality of U.S. forestry products.

This program invites both fundamental and mission-linked proposals for innovative research in the following priority areas:

#### **Wood chemistry and biochemistry**

Research is needed that advances understanding of the principles governing the biological, physical, or chemical reactions in wood and wood formation and wood-based materials.

**Physical/mechanical properties of wood and basic wood processing technology** Research is encouraged that advances understanding of the structure and physical properties of wood and develops innovative processes and products for more efficient conversion of wood-based materials into primary and value-added products.

#### **Structural wood engineering**

Research is needed to stimulate innovative approaches in the structural use of wood and wood-based materials as individual components and in systems.

During the review process, applications that address these program priorities will be given higher priority for funding. Research and integrated projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

### **75.0 Nanoscale Science and Engineering for Agriculture and Food Systems**

*Investigators are encouraged to contact Hongda Chen, National Program Leader at (202) 401-6497 regarding questions about suitability of research topics (or e-mail at [hchen@csrees.usda.gov](mailto:hchen@csrees.usda.gov) to arrange a telephone consultation).*

*This program complements the Nanoscale Exploratory Research (NER) program of the National Science Foundation's (NSF) solicitation 03-043 and emphasizes agriculturally relevant research. The focus is on the frontiers of nanoscale science and engineering, where exploratory research of high-risk/high-reward potential is a priority. Thus, standard research project awards for this special exploratory program are not likely to exceed a total budget (including indirect costs) of \$200,000 for 2 years of support.*

*Program Deadline: Proposals must be **received by** 5:00 P.M., Eastern Time, March 16, 2004*

Nanoscale science and engineering refer to the fundamental understanding and resulting technological advances arising from the exploitation of new physical, chemical, and biological properties of systems that are in the length scale of approximately 1 to 100 nanometers. Exciting novel structures, phenomena, and processes have been observed at the nanoscale in the recent years, and new experimental, theoretical and simulation tools have been developed for investigating them. These advances provide numerous fresh opportunities for scientific and technological developments in, but not limited to, nanoparticles, nanostructured materials, nanodevices, nanosensors and smart systems integration. Multi- and cross-disciplinary approach is highly encouraged. The National Nanotechnology Initiative (NNI) is an interagency program that coordinates the Federal nanoscale research, development, and education portfolio to harness the benefits of revolutionary discoveries in this area. As a partner agency in the NNI, the CSREES creates this new program to accelerate the pace of the fundamental research and development of nanoscale science and engineering for agriculture and food systems.

This program invites both fundamental and mission-linked proposals for innovation research in the following priority areas: (a) to develop fundamental understanding of biological systems and biologically inspired materials in which nanostructures exhibit novel physical, chemical, and/or biological properties and play an important role in biological function; and (b) to improve understanding of nanoscale sensing mechanisms and to test the concepts of nanosensors for detecting pathogens, toxins, contaminants, allergens, nutrients, pesticides,

fertilizers, and other physical, physiological, and biochemical indices important to food and agricultural systems.

During the review process, applications that address these program priorities will be given higher priority for funding. Research projects that address topics of great importance and are of exceptional merit that have not been listed as priorities will be reviewed and may be funded within the limits of the program budget. If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

## **PART III—ELIGIBILITY INFORMATION**

### ***A. Eligible Applicants***

For research projects, the eligibility requirements for the NRI are as follows: except where otherwise prohibited by law, State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, national laboratories, private organizations or corporations, and individuals are eligible to apply for and to receive a competitive grant. The Agricultural Research Enhancement Awards (AREA) have some notable differences from these requirements. See Part II, C., 2. for details.

For integrated projects, the eligibility requirements for the NRI are as follows: except where otherwise prohibited by law, State agricultural experiment stations, all colleges and universities, research foundations maintained by colleges or universities, private research organizations with established and demonstrated capacities to perform research or technology transfer, Federal research agencies, and national laboratories are eligible to apply for and receive a competitive grant. The bridge grants have some notable differences from these requirements. See Part II, C., 3(b) for details.

Unsolicited applications will not be considered and applications from scientists at non-United States organizations will not be accepted. Award recipients may subcontract to organizations not eligible to apply provided such organizations are necessary for the conduct of the project.

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

If an applicant considers itself a minority-serving institution and wishes to be considered for a bridge grant (as described in Part II, C., 3(b)), but is unable to meet the enrollment criteria specified in the Definitions section of this RFA, the applicant must submit to CSREES documentation supporting the request. This documentation must be submitted as part of the requestor's application package and must be received by CSREES by the deadlines in Part II, E.. The Secretary or designated individual will determine whether the group or groups identified are eligible under this Program.

The Request for Determination must be submitted as a separate letter to the relevant National Program Leader (identified in Part II, E. of this RFA). The legend at the top of the letter must read: "REQUEST FOR DETERMINATION". In addition, the following information must be provided in the order specified below:

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

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

For research projects, unless otherwise indicated, cost sharing or matching is not required for NRI awards. See Part II, C., 2(c) for cost sharing requirements for equipment grants.

For integrated projects, if a grant is for applied research that 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.

## **PART IV—APPLICATION AND SUBMISSION INFORMATION**

### ***A. Address to Request Application Package***

Program application materials are available at the CSREES Funding Opportunities web site (<http://www.reeusda.gov/1700/funding/ourfund.htm>). The CSREES application forms are also accessible through the NRI home page (<http://www.reeusda.gov/nri>). If you do not have access to the web page or have trouble downloading material and you would like a hard copy, you may contact the Proposal Services Unit, Competitive Programs, USDA/CSREES at (202) 401-5048. When calling the Proposal Services Unit, please indicate that you are requesting the RFA and associated application forms for the National Research Initiative Competitive Grants Program. These materials also may be requested via Internet by sending a message with your name, mailing address (not e-mail) and phone number to [psb@csrees.usda.gov](mailto:psb@csrees.usda.gov). State that you want a copy of the RFA and the associated application forms for the National Research Initiative Competitive Grants Program.

### ***B. Content and Form of Application Submission***

The applications should be prepared following the guidelines and the instructions below. Each application must contain the following elements in the order indicated:

#### **1. INTEGRATED AND STANDARD RESEARCH GRANT APPLICATIONS**

##### **a. General**

Use the following guidelines to prepare an application. Proper preparation of applications will assist reviewers in evaluating the merits of each application in a systematic, consistent fashion:

- (1) Prepare the application on only one side of the page using standard size (8 1/2" x 11") white paper, one-inch margins, typed or word processed using no type smaller than 12 point font, and single or double spaced. Use an easily readable font face (e.g., Geneva, Helvetica, Times Roman).
- (2) Number each page of the application sequentially, starting with the Project Description, including the budget pages, required forms, and any appendices.
- (3) Staple the application in the upper left-hand corner. Do not bind. An original and 14 copies of the application are required (except for applications for Research Career Enhancement Awards [Sabbatical Awards], Equipment Grants, and Seed Grants for which an original and 10 copies of the application should be submitted) along with 2 additional copies of the "Project Summary," Form CSREES-2003, as a separate attachment. Prior to mailing, compare the application with the checklist found at the end of this document to ensure the application is complete.
- (4) Include original illustrations (photographs, color prints, etc.) in all copies of the application to prevent loss of meaning through poor quality reproduction.
- (5) The contents of the application should be assembled in the following order:
  - (a) Proposal Cover Page (Form CSREES-2002)
  - (b) Table of Contents
  - (c) Project Summary (Form CSREES-2003)
  - (d) Response to Previous Review (if applicable)

- (e) Project Description (see instructions for page limitations)
- (f) References to Project Description
- (g) Facilities and Equipment
- (h) Key Personnel (vitae and publications list)
- (i) Collaborative Arrangements (including letters of support)
- (j) Conflict-of-Interest List (Form CSREES-2007)
- (k) Results from Prior NRI Support (if applicable)
- (l) Budget (Form CSREES-2004)
- (m) Budget Narrative
- (n) Matching (if required)
- (o) Current and Pending Support (Form CSREES-2005)
- (p) Assurance Statement(s) (Form CSREES-2008)
- (q) Compliance with the National Environmental Policy Act (NEPA) (Form CSREES-2006)
- (r) Appendices to Project Description
- (s) Personal Data on Project Director(s) (Page B of Form CSREES-2002)

**b. Proposal Cover Page (Form CSREES-2002)**

**Page A**

Each copy of each grant application must contain a Proposal Cover Page, Form CSREES-2002. One copy of the application, preferably the original, must contain the pen-and-ink signature(s) of the proposing PDs and the AOR, the individual who possesses the necessary authority to commit the organization's time and other relevant resources to the project. If there are more than three co-PDs for an application, please list additional co-PDs on a separate sheet of paper (with appropriate information and signatures) and attach to the Proposal Cover Page (Form CSREES-2002). Any proposed PD or co-PD whose signature does not appear on Form CSREES-2002 or attached additional sheets will not be listed on any resulting grant award. Complete both signature blocks located at the bottom of the Proposal Cover Page form. Please note that Form CSREES-2002 is comprised of two parts - Page A, which is the Proposal Cover Page, and Page B, which is the Personal Data on Project Director.

Form CSREES-2002 serves as a source document for the CSREES grant database; it is therefore important that it be accurately completed in its entirety, especially the e-mail addresses requested in Blocks 4.c. and 18.c. However, the following items are highlighted as having a high potential for errors or misinterpretations:

(a) Type of Performing Organization (Blocks 6.a. and 6.b.). For Block 6.a., a check should be placed in the appropriate box to identify the type of organization which is the legal recipient named in Block 1. Only one box should be checked. For Block 6.b., please check as many boxes that apply to the affiliation of the PD listed in Block 16.

(b) Title of Proposed Project (Block 7). The title of the project must be brief (140-character maximum, including spaces), yet represent the major thrust of the effort being proposed. Project titles are read by a variety of nonscientific people; therefore, highly technical words or phraseology should be avoided where possible. In addition, introductory phrases such as “investigation of,” “research on,” “education for,” or “outreach that” should not be used.

(c) Program to Which You Are Applying (Block 8). Enter “NRI”. The program area (i.e., name of the program component) and number (e.g., 61.0 Markets and Trade) should also be inserted in Block 8.

(d) DUNS NO. (Data Universal Numbering System) (Block 11.). A DUNS number must be included for the legal recipient named in Block 1. (except applications from individuals). See Part VIII, J.

(e) Type of Request (Block 14). Check the appropriate box for your application. For “Renewals” and “Resubmitted Renewals,” the prior USDA Award Number must be identified.

(f) Project Director (PD) (Blocks 16-19). Blocks 16-18 are used to identify the PD and Block 19 to identify co-PDs. If needed, additional co-PDs may be listed on a separate sheet of paper and attached to Form CSREES-2002, the Proposal Cover Page, with the applicable co-PD information and signatures. Listing multiple co-PDs, beyond those required for genuine collaboration, is discouraged.

(g) Other Possible Sponsors (Block 21). List the names or acronyms of all other public or private sponsors including other agencies within USDA to which your application has been or might be sent. In the event you decide to send your application to another organization or agency at a later date, you must inform the identified CSREES program contact as soon as practicable. Submitting your application to other potential sponsors will not prejudice its review by CSREES; however, submitting the same (i.e., duplicate) application to another CSREES program is not permissible.

### **Page B**

Page B should be submitted only with the original signature copy of the application and should be placed as the last page of the original copy of the application. This page contains personal data on the PD(s). CSREES requests this information in order to monitor the operation of its review and awards processes. This page will not be duplicated or used during the review process. Please note that failure to submit this information will in no way affect consideration of your application.

### **c. Table of Contents**

For consistency and ease in locating information, each application must contain a detailed Table of Contents immediately following the Proposal Cover Page. The Table of Contents should contain page numbers for each component of the application. Page numbering should begin with the first page of the Project Description. A Table of Contents page is included at the end of this RFA for your convenience. It should be used in the preparation of an application.

### **d. Project Summary (Form CSREES-2003)**

The application must contain a Project Summary, Form CSREES-2003. The summary should be approximately 250 words, contained within the box, placed immediately after the Table of Contents, and not numbered. The names and affiliated organizations of the PD and all co-PDs should be listed on this form, in addition to the title of the project. The summary should be a self-contained, specific description of the activity to be undertaken and should focus on: overall project goal(s) and supporting objectives; plans to accomplish project goal(s); and relevance of the project to the goals of the NRI. The PD(s) should also indicate in the Project Summary which of the six Agricultural Issues (Part II, D.) the proposed project addresses. The importance of a concise, informative Project Summary cannot be overemphasized. If there are more than three co-PDs for an application, please list additional co-PDs on a separate sheet of paper (with appropriate information) and attach to the Project Summary (Form CSREES-2003). (Please check the appropriate “Proposal Type” you are submitting in the box on the upper right-hand portion of the form. For integrated projects, please check the “Standard Research proposal” box.)

### **e. Response to Previous Review**

This requirement only applies to “Resubmitted Applications” and “Resubmitted Renewal Applications” as described in Part II. B., Types of Applications. PDs must respond to the previous review panel summary on no more than one page, titled “RESPONSE TO PREVIOUS REVIEW,” which is to be placed directly after the Project Summary, Form CSREES-2003. If desired, additional comments may be included in the text of the Project Description, subject to the page limitations of that section.

## **f. Project Description**

**PLEASE NOTE: For Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, and Seed Grants, the Project Description section may not exceed a total of 7 single or double-spaced pages including figures and tables. For all other types of applications, the Project Description section may not exceed a total of 18 single- or double-spaced pages including figures and tables.** These page limitations apply regardless of whether figures or tables are included. All pages, including those with figures and tables, should be numbered sequentially. Applications exceeding the applicable page limitation may be returned without review. These maximums have been established to ensure fair and equitable competition. Project Descriptions must include all of the following:

*(a) Introduction.* A clear statement of the long-term goal(s) and supporting objectives or research questions of the proposed project should be included. Summarize the body of knowledge or other past activities that substantiate the need for the proposed project. Describe ongoing or recently completed significant activities related to the proposed project including the work of key project personnel. Preliminary data/information pertinent to the proposed research should be included in this section. All works cited should be referenced (see 7., References to Project Description, below).

*(b) Progress Report.* If the application is a renewal of an existing project supported under this program (or its predecessor), include a clearly marked progress report describing results to date from the previous award. In addition, the progress report must be contained within the 18-page limit and should contain the following information:

- (1) A comparison of actual accomplishments with the objectives established for the previous award;
- (2) The reasons established objectives were not met, if applicable; and
- (3) A listing of any publications resulting from the award. Copies of no more than 2 preprints or reprints may be appended to the application (see section on Appendices to Project Description).

*(c) Rationale and Significance.* Concisely present the rationale behind the proposed research. The specific relationship of the project’s objectives to the potential long-range improvement in and sustainability of U.S. agriculture or to one or more of the particular program areas should be shown clearly. These purposes are described under Part I, B., Purpose and Priorities. Any novel ideas or contributions that the proposed project offers should also be discussed in this section.

*(d) Approach.* The activities proposed or problems being addressed must be clearly stated and the approaches being applied clearly described. Specifically, this section must include:

- (1) A description of the activities proposed and the sequence in which the activities are to be performed;
- (2) Methods to be used in carrying out the proposed project, including the feasibility of the methods;
- (3) Expected outcomes;

- (4) Means by which results will be analyzed, assessed, or interpreted;
- (5) How results or products will be used;
- (6) Pitfalls that may be encountered;
- (7) Limitations to proposed procedures; and
- (8) 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.

#### **g. References to Project Description**

All references to works cited should be complete, including titles and all co-authors, and should conform to an acceptable journal format. References are not considered in the page-limitation for the Project Description.

#### **h. Facilities and Equipment**

Facilities and major items of equipment that are available for use or assignment to the proposed project during the requested period of support should be described. In addition, items of nonexpendable equipment necessary to conduct and successfully conclude the proposed project should be listed (including dollar amounts), and, if funds are requested for their acquisition, justified on a separate page and attached to the budget.

#### **i. Key Personnel**

The following should be included, as applicable:

- (a) The roles and responsibilities of the PD, co-PD, and/or collaborator should be clearly described; and
- (b) The vitae of the PD and each co-PD, senior associate, and other professional personnel. This section should include vitae of all key persons who are expected to work on the project, whether or not CSREES funds are sought for their support. The vitae should be limited to two (2) pages each in length, excluding publications listings. The vitae should include a presentation of academic and research credentials, as applicable, e.g., earned degrees, teaching experience, employment history, professional activities, honors and awards, and grants received. A chronological list of **all** publications in **refereed journals** during the past **four (4) years**, including those in press, must be provided for each project member for whom a curriculum vita is provided. Also list only those **non-refereed** technical publications that have **relevance** to the proposed project. All authors should be listed in the same order as they appear on each paper cited, along with the title and complete reference as these usually appear in journals.

#### **j. Collaborative Arrangements**

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 vitae or resume should be provided. In addition, evidence (e.g., letter of support) should be provided that the collaborators involved have agreed to render these services. The applicant also

will be required to provide additional information on consultants and collaborators in the budget portion of the application. See instructions in the application forms for completing Form CSREES-2004, Budget.

#### **k. Conflict-of-Interest List (Form CSREES-2007)**

A “Conflict-of-Interest List,” Form CSREES-2007, must be provided for all individuals who have submitted a vitae in response to item 9(b) of this part. Each Form CSREES-2007 should list alphabetically, by the last names, the full names of the individuals in the following categories: (a) all co-authors on publications within the past four years, including pending publications and submissions; (b) all collaborators on projects within the past four years, including current and planned collaborations; (c) all thesis or postdoctoral advisees/advisors within the past four years; and (d) all persons in your field with whom you have had a consulting or financial arrangement within the past four years, who stand to gain by seeing the project funded. This form is necessary to assist program staff in excluding from application review those individuals who have conflicts of interest with the personnel in the grant application. The program contact must be informed of any additional conflicts of interest that arise after the application is submitted.

#### **l. Results from Prior NRI Support**

If the PD or a co-PD has received NRI support in the past five years, information on results from that prior funding is required. This information will be used in the review of the application and is limited in length to one page per award. If the application being submitted is for renewed support, provision of the Progress Report (see Project Description) is sufficient and information for that particular award need not be repeated in this section. For each award, list the CSREES award number, the amount and period of support, the title of the project, a summary of the results of the completed work, the long-term effects of these results, and the publications resulting from the NRI award.

#### **m. Budget**

##### **(1) Budget Form (Form CSREES-2004)**

Prepare the Budget, Form CSREES-2004, in accordance with instructions provided with the application forms. A budget form is required for each year of requested support. In addition, a cumulative budget is required detailing the requested total support for the overall project period. If a project is funded, beginning in the second year of funding, at least one member of the project team will be required to attend annual investigator meetings. Reasonable travel expenses for at least one project team member to attend annual meetings, beginning in the second year of funding, may be included in the requested budget. The budget form may be reproduced as needed by applicants. Funds may be requested under any of the categories listed on the form, provided that the item or service for which support is requested is allowable under the authorizing legislation, the applicable statutes, regulations, and Federal cost principles, and these program guidelines, and can be justified as necessary for the successful conduct of the proposed project (see Part IV, D. for applicable funding restrictions). Applicants also must include a budget narrative to justify their budget requests (see section (b) below).

**For Food Safety CAP, Applied Plant Breeding CAP and Animal and Plant Biosecurity applications only**, applicants may request that no more than 25% of the requested funds or \$400,000, whichever is less, be available to accomplish time-critical objectives of national interest that they will determine at a later date.

##### **(2) Budget Narrative**

All 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 budget and justified on a separate sheet of paper and placed immediately behind the Budget form.

### (3) Matching

For those research projects that require matching, a letter signed by the institution's authorized organizational representative stating that the necessary non-Federal matching funds will be made available from an institution or other source is required. If the institution is eligible for the waiver of these matching funds, the budget justification must include a letter signed by the institution's authorized organizational representative so stating and providing documentation of eligibility.

For integrated projects, if an applicant concludes that matching funds are not required (as specified under Part III, C.), a justification should be included in the Budget Narrative. CSREES will consider this justification when ascertaining final matching requirements. CSREES retains the right to make final determinations regarding matching requirements.

For those integrated projects where matching funds are required (as specified under Part III, C.), applications should include written verification of commitments of matching support (including both cash and in-kind contributions) from third parties. Written verification means:

For any third party cash contributions, a separate pledge agreement for each donation, signed by the authorized organizational representative of the donor organization and the applicant organization, which must include: (1) The name, address, and telephone number of the donor; (2) the name of the applicant organization; (3) the title of the project for which the donation is made; (4) the dollar amount of the cash donation; and (5) a statement that the donor will pay the cash contribution during the grant period.

For any third party in-kind contributions, a separate pledge agreement for each contribution, signed by the authorized organizational representatives of the donor organization and the applicant organization, which must include: (1) The name, address, and telephone number of the donor; (2) the name of the applicant organization; (3) the title of the project for which the donation is made; (4) a good faith estimate of the current fair market value of the third party in-kind contribution; and (5) a statement that the donor will make the contribution during the grant period.

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 Narrative. 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 the applicable cost principles. Applicants should refer to OMB Circulars A-21, Cost Principles for Educational Institutions, A-87, Cost Principles for State, Local, and Tribal Governments, A-122, Cost Principles for Non-Profit Organizations, and the cost principles in the Federal Acquisition Regulation at 48 CFR 31.2 for further guidance and other requirements relating to matching and allowable costs.

### **n. Current and Pending Support (Form CSREES-2005)**

All applications must contain Form CSREES-2005 listing other current public or private support (including in-house support) to which personnel (i.e., individuals submitting a vitae in response to item 9(b) of this part) 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 follow the instructions provided on this form. Concurrent submission of identical or similar applications to the possible sponsors will not prejudice application review or evaluation by the CSREES. However, an application that duplicates or overlaps substantially with an application already reviewed and funded (or to be funded) by another organization or agency will not be funded under this program. **Please note that the project being proposed should be included in the pending section of the form.**

**o. Assurance Statement(s) (Form CSREES-2008)**

A number of situations encountered in the conduct of projects require special assurances, supporting documentation, etc., before funding can be approved for the project. In addition to any other situation that may exist with regard to a particular project, applications involving any of the following elements must comply with the additional requirements as applicable.

(1) Recombinant DNA or RNA Research

All key personnel identified in the application and all endorsing officials of the proposing organization are required to comply with the guidelines established by the National Institutes of Health entitled, "Guidelines for Research Involving Recombinant DNA Molecules," as revised. If your project proposes to use recombinant DNA or RNA techniques, you must so indicate by checking the "yes" box in Block 20 of Form CSREES-2002 (the Proposal Cover Page) and by completing Section A of Form CSREES-2008. For applicable applications recommended for funding, Institutional Biosafety Committee approval is required before CSREES funds will be released. Please refer to the application forms for further instructions.

(2) Animal Care

Responsibility for the humane care and treatment of live vertebrate animals used in any grant project supported with funds provided by CSREES rests with the performing organization. Where a project involves the use of living vertebrate animals for experimental purposes, all key personnel identified in an application and all endorsing officials of the proposing organization are required to comply with the applicable provisions of the Animal Welfare Act, as amended (7 U.S.C. 2131 et seq.), and the regulations promulgated thereunder by the Secretary in 9 CFR Parts 1, 2, 3, and 4 pertaining to the care, handling, and treatment of these animals. If your project will involve these animals, you should check "yes" in Block 20 of Form CSREES-2002 and complete Section B of Form CSREES-2008. In the event a project involving the use of live vertebrate animals results in a grant award, funds will be released only after the Institutional Animal Care and Use Committee has approved the project. Please refer to the application forms for further instructions.

(3) Protection of Human Subjects

Responsibility for safeguarding the rights and welfare of human subjects used in any grant project supported with funds provided by CSREES rests with the performing organization. Guidance on this issue is contained in the National Research Act, Pub. L. No. 93-348, as amended, and implementing regulations promulgated by the Department under 7 CFR Part 1c. If you propose to use human subjects in your project, you should check the "yes" box in Block 20 of Form CSREES-2002 and complete Section C of Form CSREES-2008. In the event a project involving human subjects at risk is recommended for award, funds will be released only after the Institutional Review Board (IRB) has approved the research plan and CSREES has accepted documentation of the IRB approval. Please refer to the application forms for additional instructions.

**p. Certifications**

Note that by signing Form CSREES-2002, the Proposal Cover Page, the applicant is providing the certifications required by 7 CFR Part 3017, regarding Debarment and Suspension and Drug-Free Workplace, and 7 CFR Part 3018, regarding Lobbying. The certification forms are included in the application package for informational purposes only. These forms should not be submitted with the application since by signing Form CSREES-2002 your organization is providing the required certifications. If the project will involve a subcontractor or consultant, the subcontractor/consultant should submit a Form AD-1048, Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions, to the grantee organization for retention in their records. This form should not be submitted to USDA.

#### **q. Compliance with the National Environmental Policy Act (NEPA) (Form CSREES-2006)**

As outlined in 7 CFR Part 3407 (the CSREES regulations implementing NEPA), the environmental data for any proposed project is to be provided to CSREES so that CSREES may determine whether any further action is needed. In some cases, however, the preparation of environmental data may not be required. Certain categories of actions are excluded from the requirements of NEPA.

In order for CSREES to determine whether any further action is needed with respect to NEPA, pertinent information regarding the possible environmental impacts of a particular project is necessary; therefore, Form CSREES-2006, "NEPA Exclusions Form," must be included in the application indicating whether the applicant is of the opinion that the project falls within a categorical exclusion and the reasons therefore. If it is the applicant's opinion that the proposed project falls within the categorical exclusions, the specific exclusion(s) must be identified.

Even though a project may fall within the categorical exclusions, CSREES may determine that an Environmental Assessment or an Environmental Impact Statement is necessary for an activity if substantial controversy on environmental grounds exists or if other extraordinary conditions or circumstances are present which may cause such activity to have a significant environmental effect.

#### **r. Appendices to Project Description**

Each Project Description is expected to be complete; however, additions to the Project Description (appendices) are allowed if they are directly germane to the proposed research and are strictly limited to a maximum of 2 of the following:

- (1) Reprints (papers that have been published in peer-reviewed journals)
- (2) Preprints (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 sent in support of the application should be single-spaced and printed on both sides of the page. 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, and be securely attached to each copy of the application.

Staff of the NRI will not collate applications or application addenda. Information may not be appended to an application to circumvent page limitations prescribed for the Project Description. Extraneous materials will not be used during the peer review process.

## **2. RESEARCH CONFERENCE APPLICATIONS**

Submit applications requesting support for research conferences to an appropriate research program, Part II, E., Research Opportunities, by the deadline for that particular program. **Applicants considering submission under this category are strongly advised to consult the appropriate NRI staff before preparation and submission of the application.** The application should include:

- a. Proposal Cover Page (Form CSREES-2002)** appropriately completed and signed;
- b. Project Summary (Form CSREES-2003)** stating the objectives of the research conference, symposium, or workshop, as well as the proposed location and probable inclusive date(s) of the conference. Check the box marked “Conference” in the upper right-hand corner of the Project Summary form (Form CSREES-2003);
- c. Project Description** describing the conference proposed, including:
  - (1) A justification for the meeting;
  - (2) Recent meetings on the same subject with dates and locations;
  - (3) Names and organizational affiliations of the chairperson and other members of the organizing committee;
  - (4) A proposed program (or agenda) for the conference, including a listing of scheduled participants and their institutional affiliations; and
  - (5) The method of announcement or invitation that will be used.
- d. Curriculum Vita** for the submitting PD(s) and a brief listing of relevant publications (each vita and publications listing, combined, should not exceed three (3) pages);
- e. Conflict-of-Interest List (Form CSREES-2007)** for each person for whom a vita is submitted;
- f. An estimated total Budget (Form CSREES-2004)** for the conference, together with an itemized breakdown of all support requested from the NRI. The budget for the conference may include an appropriate amount for transportation and subsistence costs for participants and for other conference-related costs;
- g. Current and Pending Support (Form CSREES-2005);** and
- h. Appropriate Assurance Statement(s) (Form CSREES-2008), Certifications, and National Environmental Policy Act Exclusions Form (Form CSREES-2006)** (see instructions for Integrated and Standard Research Grant Applications, Part IV, B., 1., q.).

### **3. AGRICULTURAL RESEARCH ENHANCEMENT AWARDS (AREA) APPLICATIONS**

#### **a. Postdoctoral Fellowships**

*See Part III, A. and Part II, C., 2(a) for eligibility requirements.*

Submit applications requesting support for postdoctoral fellowships to **an appropriate research program, Part II, E., Research Opportunities, by the designated deadline for that particular program**. Such applications may be submitted either directly by the individual or through the mentor's institution. The postdoctoral applicant must be the sole PD listed on the application. Applications should contain all of the components of, and be assembled in the order described in, Part IV, B., 1., Integrated and Standard Research Grant Applications.

Additional instructions include:

**(1) Proposal Cover Page (Form CSREES-2002).** If the application is submitted through an institution, Form CSREES-2002 must be endorsed by the AOR who possesses the necessary authority to commit the applicant's time and other relevant resources. If the application is submitted by the individual instead of an institution, Form CSREES-2002 should be signed only by the proposing postdoctoral applicant;

**(2) Project Summary (Form CSREES-2003).** Check the box marked "Postdoctoral" in the upper right-hand corner of the form;

**(3) Documentation that arrangements have been made with an established investigator to serve as mentor.** *The letter also must provide assurance that the proposed project initiates the postdoctoral student's independent research program. Although the project may fit in the context of the mentor's existing research area, it should not simply be an extension of ongoing projects in the mentor's laboratory;*

**(4) Documentation that arrangements have been made for the necessary facilities, space, and materials for conduct of the research;**

**(5) Documentation from the host institution's AOR indicating that the host institution concurs with the above arrangements.** Postdoctoral applicants from Federal laboratories must notify the appropriate regional office;

**(6) Conflict-of-Interest List (Form CSREES-2007)** for the postdoctoral applicant and the scientific mentor;

**(7) Budget (Form CSREES-2004).** The budget is limited to \$110,000 and to two year's duration. Funds should be requested primarily for salary support although other expenditures (e.g., supplies, travel, and publication costs) are allowable costs if properly justified. An institutional allowance not to exceed \$2,400/year may be requested but is part of the \$110,000 limitation. The institutional allowance should be included under item J, "Other Direct Costs" on the Budget form;

**(8) Current and Pending Support (Form CSREES-2005)** for both the postdoctoral applicant and the scientific mentor (as documentation of on-going work in the mentor's laboratory);

**(9) Assurance Statements (Form CSREES-2008).** Postdoctoral fellowship applicants whose research requires Assurance Statements (see Part IV, B., 1., o. under Integrated and Standard Research Grant

Applications), must have their project reviewed by the appropriate committee(s) at the institution where the research will be conducted. Assurance Statements must be signed by an AOR of that institution (see also Part IV, B., 1., o. under Integrated and Standard Research Grants Applications for more information about the role of other institutions in performing this service);

**(10) Certifications** regarding Debarment and Suspension, Drug-Free Work Place, and Lobbying; and

**(11) National Environmental Policy Act Exclusions Form (Form CSREES-2006).**

**b. New Investigator Awards**

*See Part III, A. and Part II, C., 2(b) for eligibility requirements.*

Research applications from new investigators should be submitted to **an appropriate research program, Part II, E., Research Opportunities, by the designated deadline for that particular program**. Applications should contain all of the components of, and be assembled in the order described in Part IV, B., 1., Integrated and Standard Research Grant Applications. Check the box marked “New Investigator” in the upper right-hand corner of the **Project Summary form (Form CSREES-2003)**.

**c. Strengthening Awards**

**(1) Research Career Enhancement Awards (Sabbatical Awards):**

*See Research Career Enhancement Awards (Sabbatical Awards) in Part III, A. and Part II, C., 2(c) for eligibility requirements.*

Applications from eligible faculty wishing to enhance their research capabilities through sabbatical leaves are encouraged. Applications should be submitted to **an appropriate research program, Part II, E., Research Opportunities, by the deadline for that particular program**. Applications should originate through the applicant's home institution and **an original and 10 copies should be submitted**. The following guidelines apply:

**(a) Proposal Cover Page (CSREES-2002)** completed as described in Part IV, B., 1., Integrated and Standard Research Grant Applications. Indicate NRI and the program code of the appropriate research program in Block 8;

**(b) Project Summary (Form CSREES-2003)** indicating overall project goals and supporting objectives. Check the box marked “Career Enhancement” in the upper right-hand corner of the Project Summary;

**(c) Project Description** describing the proposed sabbatical (**limited to seven (7) pages including figures and tables**), including:

**(d) A general description of the research interests and goals of the applicant in order to provide perspective for the application;**

**(e) A description of the research project to be pursued while on the sabbatical leave;**

**(f) A statement of how the proposed activities will serve to enhance the scientific research capabilities of the applicant; and**

**(g) 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.**

**(h) Curriculum Vita, Publication Lists (including titles), and Conflict of Interest Lists (Form CSREES-2007)** for the applicant, the scientific host and any other personnel whose qualifications merit consideration in the evaluation of the application. Follow detailed instructions for these items provided under Part IV, B., 1., Integrated and Standard Research Grant Applications;

**(i) A letter from the home institution detailing the particular arrangements at the home institution with respect to salary and date and duration of sabbatical;**

**(j) A letter from the scientific host 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;**

**(k) 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;**

**(l) Budget (Form CSREES-2004) and Budget Justification.** The budget should be limited to one year's salary and funds for travel and supplies; and

**(m) Current and Pending Support (Form CSREES-2005).**

**(n) Assurance Statements (Form CSREES-2008).** Applicants whose research requires a Form CSREES-2008 (see Part IV, B., 1, o. under Integrated and Standard Research Grant Applications), must have their project reviewed and approved by the appropriate committee(s) at the institution where the research will be conducted. The CSREES-2008 must be signed by an AOR of that institution (see also Part IV, B., 1, o. under Integrated and Standard Research Grant Applications for more information about the role of other institutions in performing this service);

**(o) Certifications** regarding Debarment and Suspension, Drug-Free Workplace, and Lobbying; and

**(p) National Environmental Policy Act Exclusions Form (Form CSREES-2006).**

## **(2) Equipment Grants:**

*See Equipment Grants, in Part III, A. and Part II, C., 2(c) for eligibility requirements.*

Applications requesting assistance in purchasing equipment must be submitted as Equipment Grant applications. Applications should be submitted to **an appropriate research program, Part II, E., Research Opportunities, by the deadline designated for that particular program. An original and 10 copies of the application should be submitted.** Applications for Equipment Grants should include the following:

**(a) Proposal Cover Page (CSREES-2002)** completed as described in Part IV, B., 1., Integrated and Standard Research Grant Applications. Indicate NRI and the program code of the appropriate research program in Block 8;

**(b) Project Summary (Form CSREES-2003)** indicating equipment sought and the overall project goals for its use. Check the box marked “Equipment” in the upper right-hand corner of the Project Summary (Form CSREES-2003);

**(c) Project Description** containing a general description of the research project(s) for which the equipment will be used, how the equipment will fit into or enhance the research program, and how the equipment will allow the applicant to become competitive for future funding or move into new research areas. **The Project Description is limited to seven (7) pages, including figures and tables;**

**(d) A brief description of other similar or complementary equipment available to the PD at the institution and why the requested equipment is necessary;**

**(e) Curriculum Vita, Publication Lists (including titles), and Conflict of Interest Lists (Form CSREES-2007)** for the applicant and other major users of the equipment. Follow detailed instructions for these items provided under Part IV, B., 1., Integrated and Standard Research Grant Applications;

**(f) Budget Form (CSREES-2004) and Budget Justification.** See Part II, C., 2(c) for budget limitations, matching requirements, waiver conditions and cost restrictions. 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 item of equipment. A letter signed by the institution’s AOR stating that the necessary non-Federal matching funds will be made available from an institutional or other source is required. If the institution is eligible for the waiver of these matching funds, the budget justification must include a letter signed by the institution’s AOR so stating and providing documentation of eligibility;

**(g) Current and Pending Support (Form CSREES-2005),** as outlined in Part IV, B, 1., Integrated and Standard Research Grant Applications. If the applicant has significant funding from other sources, a justification must be given for how this equipment will strengthen the applicant's research program or institution;

**(h) Certifications** regarding Debarment and Suspension, Drug-free Work Place, and Lobbying; and

**(i) National Environmental Policy Act Exclusions Form (Form CSREES-2006).**

**(3) Seed Grants:**

*See Seed Grants, in Part III, A. and Part II, C., 2(c) for eligibility requirements.*

Applications from eligible faculty wishing to collect preliminary data should be submitted as Seed Grant applications. Applications should be submitted to **an appropriate research program, Part II, E., Research Opportunities, by the deadline for that particular program. An original and 10 copies of the application should be submitted.** Applications should contain all of the components of, and be assembled in the order described in, Part IV, B., 1., Integrated and Standard Research Grant Applications. In addition, the following is required:

**(a) Project Summary (Form CSREES-2003).** Check the box marked “Seed Grant” in the upper right-hand corner of the Project Summary (Form CSREES-2003).

**(b) Project Description must be limited to seven (7) pages, including figures and tables.** The description should include all the components of a Standard Research Project application and should present enough experimental detail to allow adequate evaluation. In order to be competitive, long-term research goals and a statement on how this seed grant will allow the applicant to become competitive for future funding should be included.

**(c) Budget (Form CSREES-2004).** Note that the budget should be limited to a total of \$100,000 (including indirect costs) for two years.

#### **(4) Strengthening Standard Research Project Awards:**

*See Strengthening Standard Research Project Awards, in Part II, C, 2(c) for eligibility requirements.*

Faculty who are eligible for the Strengthening Award Program may wish to apply for a Standard Research Project Award. Applications should be directed to **an appropriate research program as described in Part II, E., Research Opportunities, by the designated deadline for that particular program.** Applications should contain all of the components and meet all of the format guidelines (including page limitations) of an Integrated or Standard Research Project Application as described in Part IV, B., 1. with the following modification:

**Project Summary (Form CSREES-2003).** Check the box marked “Standard Strengthening” in the upper right-hand corner of the Project Summary (Form CSREES-2003).

### ***C. Submission Dates and Times***

Applications must be received by COB on the dates indicated at the end of this announcement (5:00 p.m., Eastern Time) for the various program areas. Applications received after the applicable deadline will not be considered for funding. For the Food Safety CAP (32.2) and the Applied Plant Genomics CAP (52.4), optional letters of intent to apply, if submitted, must be received by COB as indicated.

### ***D. Funding Restrictions***

Unless otherwise indicated, CSREES is prohibited from paying indirect costs exceeding 19 percent of the total *Federal* funds provided under each award made on a competitive basis. This limitation is equivalent to 23.456 percent of the total *direct* costs of an award.

Funds may not be used for the renovation or refurbishment of research spaces (including energy retrofitting); purchase or installation of fixed equipment in such spaces; or planning, repair, rehabilitation, acquisition, or construction of buildings or facilities.

## ***E. Other Submission Requirements***

### **1. What to Submit**

To facilitate review panel selection, applicants to the Food Safety CAP (32.2) and the Applied Plant Breeding CAP (52.4) are asked to submit letters of intent to apply to the relevant National Program Leader by COB as indicated in Part II, E.. It is requested that these letters contain: (a) a descriptive title of the proposed project; (b) names and roles of the PD(s) and other key personnel, along with their institutions; and (c) a brief statement of approaches and objectives (500 words or less). CSREES may not provide applicants with feedback regarding the content of these letters. Failure to submit a letter of intent will not preclude consideration of an application.

An original and 14 copies of the application are required (except for applications for Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, and Seed Grants, for which an original and 10 copies of the application should be submitted) and 2 additional copies of the Project Summary, Form CSREES-2003, as a separate attachment. All copies of the application and the Project Summary must be submitted in one package.

### **2. Multiple Submissions**

Duplicate, essentially duplicate, or predominantly overlapping applications submitted to one or more program areas within the NRI (including the programs described under Agricultural Research Enhancement Awards) in any one fiscal year **will be returned without review**. In addition, applicants also may not submit to the NRI an application that is considered duplicate, essentially duplicate, or predominantly overlapping with an application submitted to another CSREES program in the same fiscal year.

### **3. Where to Submit**

Applicants are strongly encouraged to submit completed applications via overnight mail or delivery service to ensure timely receipt by the USDA. The address for hand-delivered applications or applications submitted using an express mail or overnight courier service is:

National Research Initiative Competitive Grants Program  
c/o Proposal Services Unit  
Cooperative State Research, Education, and Extension Service  
U.S. Department of Agriculture  
Room 1420, Waterfront Centre  
800 9<sup>th</sup> Street, S.W.  
Washington, D.C. 20024

Telephone: (202) 401-5048

Applications sent via the U.S. Postal Service must be sent to the following address:

National Research Initiative Competitive Grants Program  
c/o Proposal Services Unit  
Cooperative State Research, Education, and Extension Service  
U.S. Department of Agriculture  
STOP 2245  
1400 Independence Avenue, S.W.

Washington, D.C. 20250-2245

The receipt of all applications will be acknowledged by e-mail. Therefore, applicants are strongly encouraged to provide accurate e-mail addresses, where designated, on the Form CSREES-2002. If the applicant's e-mail address is not indicated, CSREES will acknowledge receipt of the application by letter.

If the applicant does not receive an acknowledgment within 60 days of the submission deadline, please contact the program contact. Once the application has been assigned a proposal number, please cite that number on all future correspondence.

## 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 be returned to the applicant. Second, a review panel will technically evaluate applications that meet these requirements. Written comments will be solicited from *ad hoc* reviewers when required, and individual written comments and in-depth discussions will be provided by a peer review panel prior to recommending applications for funding.

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 activities; (b) the need to include as reviewers experts from various areas of specialization within relevant scientific, education, or extension fields; (c) the need to include as reviewers 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 as reviewers 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 age distribution; 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*

Agricultural research 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 shall take into account the following factors.

#### **Standard Research Grants, Strengthening Standard Research Project Grants, Postdoctoral Fellowships, New Investigator Awards, Integrated Project Grants and Bridge Grants**

##### **1. Scientific merit of the application for research, extension and/or education, including:**

- (a) Novelty, innovation, uniqueness, and originality;
- (b) Where model systems are used, ability to transfer knowledge gained from these systems to organisms of importance to U.S. agriculture;
- (c) Conceptual adequacy of the research, extension, and education components, as applicable;
- (d) Clarity and delineation of objectives;
- (e) Adequacy of the description of the undertaking and suitability and feasibility of methodology;
- (f) Demonstration of feasibility through preliminary data and/or, for postdoctoral fellowships, publication record of the mentor; and

(g) Probability of success of project.

**2. Qualifications of proposed project personnel and adequacy of facilities, including:**

- (a) Qualifications of applicant (individual or team) to conduct the proposed project, including performance record and potential for future accomplishments (for Postdoctoral Fellowship applications, this applies to the mentor as well as to the postdoctoral applicant);
- (b) Demonstrated awareness of previous and alternative approaches to the problem identified in the proposal;
- (c) Institutional experience and competence in subject area; and
- (d) Adequacy of available or obtainable support personnel, facilities, and instrumentation.

**3. Planning and administration of the proposed project, including:**

- (a) Time allocated for systematic attainment of objectives; and
- (b) For multi-institutional and integrated projects, planned administration of the proposed project and its maintenance, partnerships, collaborative efforts, evaluation and monitoring efforts, and the planned dissemination of information over the duration of the project.

**4. Relevance of the proposal to improvements in and sustainability of U.S. agriculture, including:**

- (a) Documentation that the research, extension, and/or education activities are directed toward current or likely future issues or priority areas identified in this document;
- (b) For integrated activities, evident linkage of research, extension, and education functions, as appropriate;
- (c) For integrated activities, evidence of involvement of stakeholders and/or communities of interest.

**In addition to the application criteria above, applications considered for bridge grant support** will also be judged based on the potential that further funding will sustain and enhance important collaborations and activities that might lead to future program success or success in obtaining other grants.

**Applications submitted to program area 32.1, Epidemiological Approaches for Food Safety,** will also be evaluated on how well the Project Description addresses strength of collaboration and strength of coordination and management.

**Postdoctoral fellowship applications** also will be evaluated on the quality of the training environment, including:

- (a) Documentation that arrangements have been made with an established investigator to serve as mentor;
- (b) Documentation that arrangements have been made for the necessary facilities, space, and materials to conduct the proposed research; and
- (c) Potential for the postdoctoral fellow to initiate an independent research program.

## **Conference Applications**

In evaluating applications for the support of research conferences, the following factors will be considered:

- 1. Relevance of the proposed conference to agriculture in the U.S. and the appropriateness of the conference in fostering scientific exchange;**
- 2. Qualifications of organizing committee and appropriateness of invited speakers to the topic areas being covered;**
- 3. Uniqueness and timeliness of the conference; and**
- 4. Appropriateness of budget request.**

## **Research Career Enhancement Awards, Equipment Grants, and Seed Grants**

The following evaluation factors will be used in reviewing applications for **Research Career Enhancement Awards, Equipment Grants, and Seed Grants**:

- 1. The merit of the proposed activities or research equipment as a means of enhancing the research capabilities and competitiveness of the applicant and/or institution;**
- 2. The applicant's previous research experience and background;**
- 3. The appropriateness of the proposed activities or research equipment for the goals proposed; and**
- 4. Relevance of the project to long-range improvements in and sustainability of U.S. agriculture.**

### ***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., 6400 Arlington Boulevard, Suite 648, Falls Church, VA 22042. Phone: (703) 532-2300. Web site: <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. At the end of the fiscal year, names of panelists will be made available in such a way that the panelists cannot be identified with the review of any particular application.

## **PART VI—AWARD ADMINISTRATION**

### ***A. General***

Within the limit of funds available for such purpose, the awarding official of CSREES shall make grants to those responsible, eligible applicants whose applications are judged most meritorious under the procedures set forth in this RFA. 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 CSREES 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, and the applicable Department's assistance regulations (e.g., parts 3015 and 3019 of 7 CFR). The total period for which a grant is awarded (including all funded and no-cost time extensions) may not exceed five years.

### ***B. 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 CSREES program. CSREES will provide copies of forms recommended for use in fulfilling these requirements as part of the preaward process. Although an applicant may be eligible based on its status as one of these entities, there are factors which 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).

### ***C. Award Notice***

The award document will provide pertinent instructions and information shall include at a minimum the following:

1. Legal name and address of performing organization or institution to whom the Administrator has awarded a grant under the terms of this RFA;
2. Title of project;
3. Name(s) and institution(s) of PDs chosen to direct and control approved activities;
4. Identifying grant number assigned by the Department;
5. Project period, specifying the amount of time the Department intends to support the project without requiring recompetition for funds;
6. Total amount of Departmental financial assistance approved by the Administrator during the project period;
7. Legal authority(ies) under which the grant is awarded;
8. Appropriate Catalog of Federal Domestic Assistance (CFDA) number;
9. Applicable award terms and conditions (see <http://www.reeusda.gov/crgam/oep/awardterms.htm> to view CSREES award terms and conditions);

10. Approved budget plan for categorizing allocable project funds to accomplish the stated purpose of the grant award; and

11. Other information or provisions deemed necessary by CSREES to carry out its respective granting activities or to accomplish the purpose of a particular grant.

#### ***D. 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:

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

7 CFR Part 3—USDA debt collection regulations.

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 3017—USDA implementation of Governmentwide Debarment and Suspension (Nonprocurement) and 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 3052—USDA implementation of OMB Circular No. A-133, Audits of States, Local Governments, and Non-profit Organizations.

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

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).

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

Grantees are required to submit annual and summary evaluation reports via the CSREES Current Research Information System (CRIS). CRIS is an electronic, web-based inventory system that facilitates both grantee submissions of project outcomes and public access to information on Federally-funded projects.

If a project is funded, beginning in the second year of funding, at least one member of each project team will be required to attend annual investigator meetings. Reasonable travel expenses may be claimed as part of the project budget (see Part IV, B., 1., m.).

**For Animal and Plant Biosecurity projects only**, PDs should plan to present an annual progress report to principal stakeholders (e.g., in conjunction with national producer meetings, workshops, or conferences). At the project's conclusion, the project team must present a final report to the principal stakeholders in order to assure widespread dissemination and implementation of the accomplishments.

## **PART VII—AGENCY CONTACTS**

Applicants and other interested parties are encouraged to contact the NRI: telephone, (202) 401-5022; fax, (202) 401-6488; e-mail, [nricgp@csrees.usda.gov](mailto:nricgp@csrees.usda.gov). Specific questions pertaining to technical matters may be directed to the cognizant National Program Leader listed under the program area in Part II, E., Research Opportunities.

## **PART VIII—OTHER INFORMATION**

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

Copies of reviews, not including the identity of reviewers, and a summary of the panel comments will be sent to the applicant PD 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 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.

(e) Changes in Project Period: The project period may be extended by CSREES without additional financial support, for such additional period(s) as the ADO determines may be necessary to complete or fulfill the purposes of an approved project, but in no case shall the total project period exceed five years. Any extension of time shall be conditioned upon prior request by the grantee and approval in writing by the ADO, unless prescribed otherwise in the terms and conditions of a grant.

(f) Changes in Approved Budget: 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 CSREES 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 copy of an application that does not result in a grant will be retained by the Agency for a period of one year. Other copies will be destroyed. 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 collection 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 the NRI 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.

The NRI 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, or 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 the NRI for a period of one year. The remaining copies will be destroyed.

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

The following are among the materials available on the NRI home page (<http://www.reeusda.gov/nri>).

##### **NRI 2004 Request for Applications**

This document is available for the current fiscal year, and describes all of the NRI funding programs. To apply for a grant, it is necessary to obtain the CSREES “Application Forms” (May 2001) (available through the above site).

##### **CSREES “Application Forms”**

This document includes the requisite forms for application preparation.

##### **NRI Abstracts of Funded Research**

The abstracts available are nontechnical abstracts written by the Project Director of each individual grant. Each entry also includes the title, PDs, awardee institution, dollar amount, and award number for each grant. The first four digits of the proposal number indicate the fiscal year in which the application was funded.

##### **NRI Annual Report**

The NRI Annual Reports starting with FY 1995 are available. These reports include descriptions of the program concept, authorization, policy, inputs to establish research needs, program execution, and outcomes, including relevant statistics. Also, included are examples of recent research funded by the NRI.

## ***G. Electronic Subscription to NRI Documents***

A mail server has been set-up to notify subscribers when NRI publications such as its RFAs or Abstracts of Funded Research are available electronically on the World Wide Web. Subscribers will not receive the document itself, but instead will receive an e-mail containing an announcement regarding the document's availability on the Web.

To subscribe:

Send an e-mail message to: [nri-epubs@lyris.csrees.usda.gov](mailto:nri-epubs@lyris.csrees.usda.gov)  
In the body of the message, include only the word: *subscribe*

To unsubscribe:

Send an e-mail message to: [nri-epubs@lyris.csrees.usda.gov](mailto:nri-epubs@lyris.csrees.usda.gov)  
In the body of the message, include only the word: *unsubscribe*

*Please note that this is not a forum. Messages, other than those related to subscription, cannot be posted to this address.*

## ***H. Definitions***

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

*Administrator* means the Administrator of the Cooperative State Research, Education, and Extension Service (CSREES) and any other officer or employee of the Department to whom the authority involved is delegated.

*Authorized departmental officer* means the Secretary or any employee of the Department who has the authority to issue or modify grant instruments on behalf of the Secretary.

*Authorized organizational representative* means the president, director, or chief executive officer or other designated official of the applicant organization who has the authority to commit the resources of the organization.

*Department* or *USDA* means the United States Department of Agriculture.

*Education Activity* means 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.

*Extension Activity* means an act or process that delivers science-based knowledge and informal educational programs to people, enabling them to make practical decisions.

*Fundamental research* is research that tests scientific hypotheses and provides basic knowledge to assist in meeting the costs of conducting, for the benefit of the public, an identified project which is intended and designed to accomplish the purpose of the program as identified in these guidelines.

*Grant* means the award by the Secretary of funds to an eligible organization or individual to assist in meeting the costs of conducting, for the benefit of the public, an identified project which is intended and designed to accomplish the purpose of the program as identified in these guidelines.

*Grantee* means an organization designated in the grant award document as the responsible legal entity to which a grant is awarded.

*Integrated* means to bring the three components of the agricultural knowledge system (research, education, and extension) together around a problem area or activity.

*Matching* means that portion of allowable project costs not borne by the Federal Government, including the value of in-kind contributions.

*Minority* means Alaskan Native, American Indian, Asian-American, Black (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 (see Part III, B.).

*Minority-serving institution* means an academic institution whose enrollment of a single minority or a combination of minorities, as defined in this section, exceeds fifty percent of the total enrollment, including graduate and undergraduate applied research and full- and part-time students. (Applicants applying under this category should indicate the current total enrollment of the institution in a cover letter). An institution in this instance is an organization that possesses a significant degree of autonomy<sup>4</sup>.

*Mission-Linked Research* is research on specifically identified agricultural problems which, through a continuum of efforts, provides information and technology that may be transferred to users and may relate to a product, practice or process.

*Multidisciplinary project* means research, education and extension projects in which investigators from two or more disciplines are collaborating closely. These collaborations, where appropriate, may integrate the biological, physical, chemical, or social sciences.

*Peer review* means an evaluation of a proposed project for scientific or technical quality and relevance performed by experts with the scientific knowledge and technical skills to conduct the proposed work or to give expert advice on the merits of an application.

*Prior approval* means written approval evidencing prior consent by an authorized departmental officer as defined above.

*Project* means the particular activity within the scope of the program supported by a grant award.

*Project director* means the single individual designated in the grant application and approved by the Secretary who is responsible for the direction and management of the project.

*Project period* means the period, as stated in the award document, during which Federal sponsorship begins and ends.

*Research activity* means a scientific investigation or inquiry which results in the generation of knowledge.

*Secretary* means the Secretary of Agriculture and any other officer or employee of the Department to whom the authority involved is delegated.

*Small and mid-sized institutions* are academic institutions with a current total enrollment of 15,000 or less including graduate and undergraduate and full- and part-time students and that are no higher than the 50<sup>th</sup> percentile of academic institutions funded by the National Research Initiative Competitive Grants Program in the past three years and are not within the top 100 Federally funded institutions (See Table 2 at the end of this document for an alphabetical listing of the most successful institutions). (Applicants applying under this category should indicate the current total enrollment of the institution in a cover letter.). An institution in this instance is an organization that possesses a significant degree of autonomy<sup>4</sup>.

<sup>4</sup>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)

*Project period* means the period, as stated in the award document, during which Federal sponsorship begins and ends.

*Secretary* means the Secretary of Agriculture and any other officer or employee of the Department to whom the authority involved is delegated.

#### ***F. CSREES' Grants.gov Implementation Plans***

Grants.gov is an internet web site for grant and other financial assistance information (e.g., allows grant seekers to find funding opportunities). It also will serve to facilitate electronic transmission of information pertaining to grants and other financial assistance information (e.g., electronic application submission).

Beginning in February 2004, CSREES plans to initiate, on a limited basis, the receipt of applications electronically through the Grants.gov (<http://www.grants.gov>) storefront. The ability to expand the plan for electronically submitting applications is contingent on the success of the initial electronic application submissions. Detailed information about CSREES' Grants.gov plans, including important announcements, program implementation, and detailed requirements, is posted on the CSREES' web site, <http://www.ree.usda.gov/egov/csrees/implementation.htm>, which will be updated as appropriate. It is suggested that this site be visited periodically for important updates.

See the section titled, "Other Submission Requirements" for information about the format (i.e., hard copy or electronic) for the submission of proposals under this RFA.

#### ***G. DUNS Number***

A Dun and Bradstreet (D&B) Data Universal Numbering System (DUNS) number is a unique nine-digit sequence recognized as the universal standard for identifying and keeping track of over 70 million businesses worldwide. A Federal Register notice of final policy issuance (68 FR 38402) requires a DUNS number in every application (i.e., hard copy and electronic) for a grant or cooperative agreement (except applications from individuals) submitted on or after October 1, 2003. Therefore, potential applicants should verify that they have a DUNS number or take the steps needed to obtain one. For information about how to obtain a DUNS number go to <http://www.grants.gov>. Please note that the registration may take up to 14 business days to complete.

#### ***H. Required Registration for Grants.gov***

The Central Contract Registry (CCR) is a database that serves as the primary Government repository for contractor information required for the conduct of business with the Government. This database will also be used as a central location for maintaining organizational information for organizations seeking and receiving grants from the Government. Such organizations must register in the CCR prior to the submission of applications via grants.gov (a DUNS number is needed for CCR registration). For information about how to register in the CCR visit <http://www.grants.gov>

**UNITED STATES DEPARTMENT OF AGRICULTURE  
COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE  
NATIONAL RESEARCH INITIATIVE COMPETITIVE GRANTS PROGRAM**

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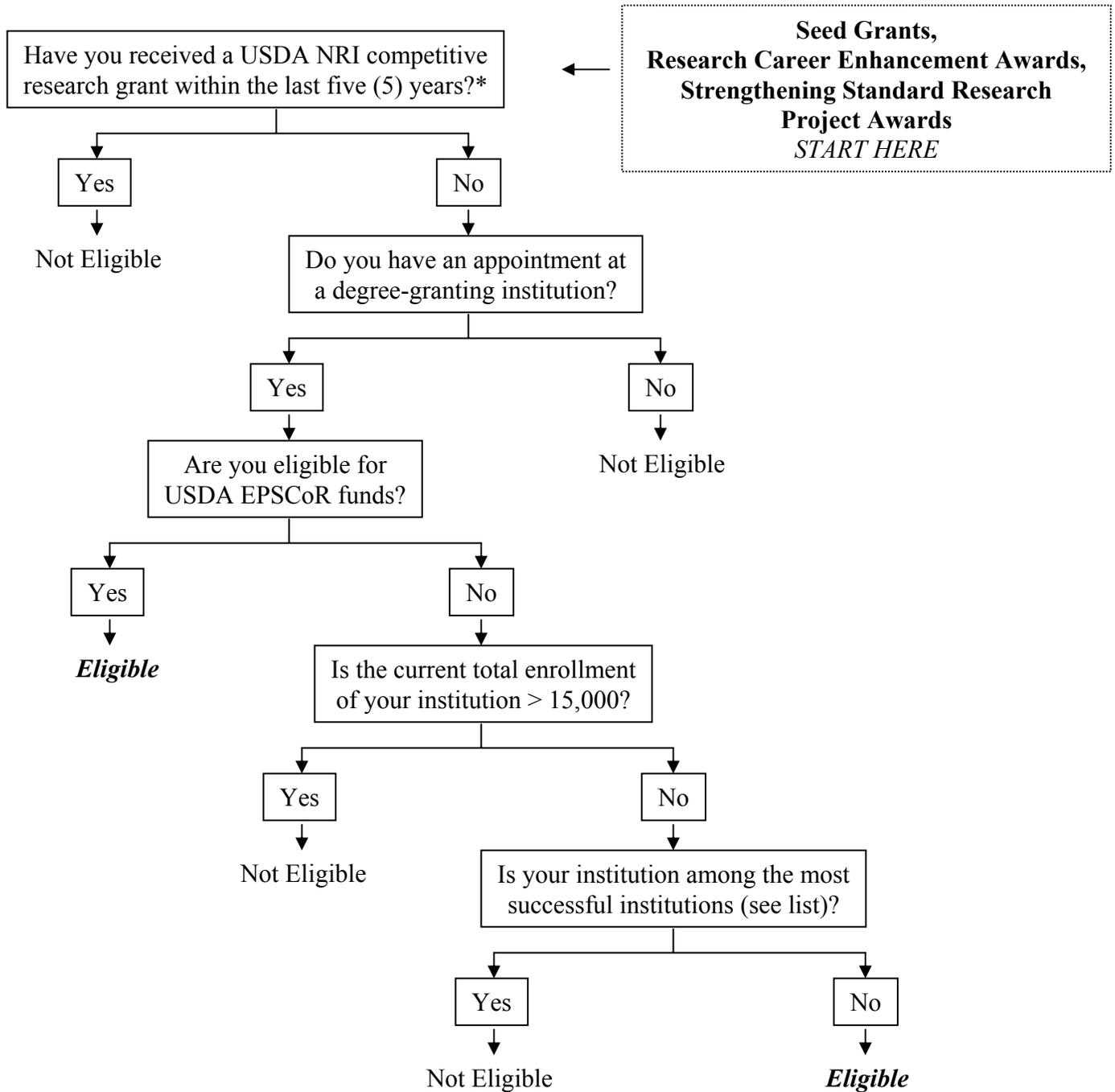
**TABLE 1.**

**Use to Determine Eligibility for Strengthening Research Awards -  
Most Successful Universities and Colleges  
Receiving Federal Funds for Science and Engineering Research and Development in FY 2001**

Baylor College of Medicine	University of Cincinnati
Boston University	University of Colorado Boulder
Brown University	University of Colorado Health Sciences Center
California Institute of Technology	University of Connecticut
Carnegie-Mellon University	University of Florida
Case Western Reserve University	University of Georgia
Colorado State University	University of Hawaii Manoa
Columbia University	University of Kentucky
Cornell University	University of Illinois Urbana-Champaign
CUNY Mount Sinai School of Medicine	University of Illinois Chicago
Dartmouth College	University of Iowa
Duke University	University of Maryland Baltimore Prof Sch
Emory University	University of Maryland College Park
George Washington University	University of Massachusetts Medical School Worcester
Georgetown University	University of Medicine and Dentistry of New Jersey
Georgia Institute of Technology	University of Miami
Harvard University	University of Michigan Ann Arbor
Indiana University Purdue University at Indianapolis	University of Minnesota Twin Cities
Iowa State University	University of Missouri Columbia
Johns Hopkins University	University of New Mexico
Louisiana State University	University of North Carolina Chapel Hill
Massachusetts Institute of Technology	University of Pennsylvania
Medical College of Wisconsin	University of Pittsburgh
Medical University of South Carolina	University of Rochester
Michigan State University	University of South Florida
New York University	University of Southern California
North Carolina State University	University of Texas at Austin
Northwestern University	University of Texas Health Science Center Houston
Ohio State University	University of Texas Health Sci. Center San Antonio
Oregon Health Sciences University	University of Texas MD Anderson Cancer Center
Oregon State University	University of Texas Medical Branch Galveston
Pennsylvania State University	University of Texas SW Medical Center Dallas
Princeton University	University of Utah
Purdue University	University of Vermont
Rockefeller University	University of Virginia
Rutgers, The State University of New Jersey	University of Washington
Scripps Research Institute	University of Wisconsin Madison
Stanford University	Vanderbilt University
State University of New York at Buffalo	Virginia Polytechnic Institute and State University
State University of New York at Stony Brook	Virginia Commonwealth University
Thomas Jefferson University	Wake Forest University
University Corporation for Atmospheric Research	Washington University
University of Alabama Birmingham	Wayne State University
University of Alaska Fairbanks	Woods Hole Oceanographic Institute
University of Arizona	Yale University
University of California Berkeley	Yeshiva University, New York
University of California Davis	
University of California Irvine	
University of California Los Angeles	
University of California San Diego	
University of California San Francisco	
University of California Santa Barbara	
University of Chicago	

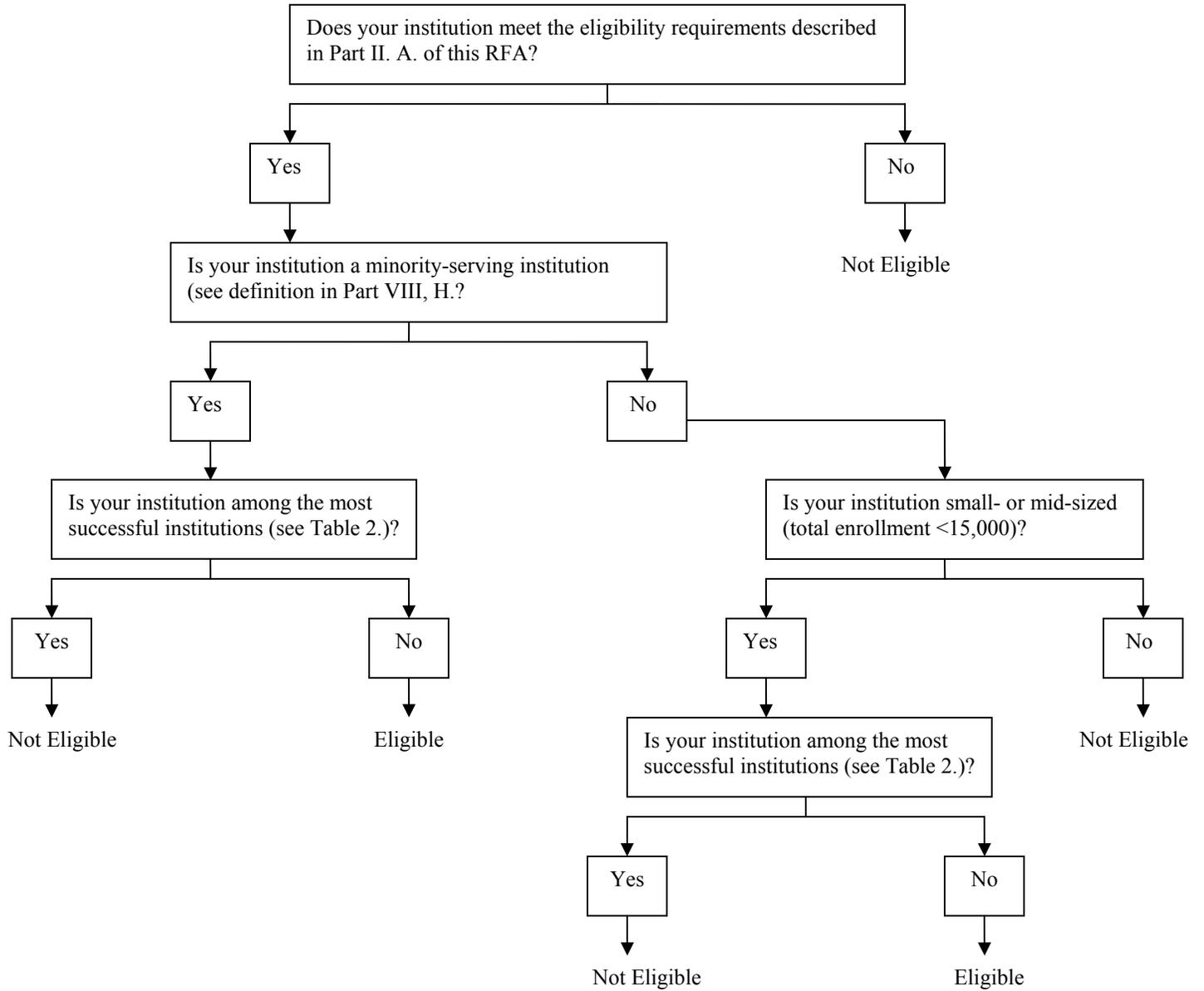
FIGURE 1.

Flow Chart for Strengthening Research Award Eligibility (Seed Grants, Research Career Enhancement Awards, Strengthening Standard Awards; NOT Equipment Grants\*)



\*The only requirements for Equipment Grants are that the institution is degree granting and not among the “top 100”. For Strengthening Standard Awards, the Project Director may have received a Seed Grant, Research Career Enhancement Award, Equipment Grant, or Postdoctoral Fellowship.

**FIGURE 2.**  
**Flow Chart for Bridge Grant Eligibility**



**Table 2.**  
**Use to Determine Eligibility for Bridge Grants**  
**Most Successful Universities and Colleges Receiving Federal and/or National Research Initiative Funds<sup>1</sup>**

Arizona State University Main Campus *	Scripps Research Institute
Auburn University *	South Dakota State University *
Baylor College of Medicine	Stanford University
Boston University	State University of New York at Binghamton *
Brown University	State University of New York at Buffalo
California Institute of Technology	State University of New York at Stony Brook
Carnegie-Mellon University	State University of New York Col. of Envir. Sci. & Forestry *
Case Western Reserve University	State University of West Georgia *
Clemson University *	Texas A&M University
Colorado School of Mines *	Texas Tech University *
Colorado State University	Thomas Jefferson University
Columbia University	University of Alabama Birmingham
Cornell University	University of Alaska Fairbanks
CUNY Mount Sinai School of Medicine	University of Arizona
Dartmouth College	University of Arkansas Fayetteville *
Drexel University *	University of California Berkeley
Duke University	University of California Davis
Emory University	University of California Irvine
Florida International University *	University of California Los Angeles
George Washington University	University of California Riverside *
Georgetown University	University of California San Diego
Georgia Institute of Technology	University of California San Francisco
Harvard University	University of California Santa Barbara
Indiana University Bloomington *	University of California Santa Cruz *
Indiana University Purdue University at Indianapolis	University of Chicago
Iowa State University	University of Cincinnati
Johns Hopkins University	University of Colorado Boulder
Kansas State University *	University of Colorado Health Sciences Center *
Louisiana State University	University of Connecticut
Massachusetts Institute of Technology	University of Delaware *
Medical College of Wisconsin	University of Florida
Medical University of South Carolina	University of Georgia
Michigan State University	University of Hawaii Manoa
Michigan Technological University *	University of Idaho *
Mississippi State University	University of Illinois Chicago
Montana State University *	University of Illinois Urbana-Champaign
New Mexico State University *	University of Iowa
New York University	University of Kansas
North Carolina State University	University of Kentucky
North Dakota State University *	University of Maine Orono *
Northwestern University	University of Maryland Baltimore Prof Sch
Ohio State University	University of Maryland Biotechnology Institute *
Oklahoma State University *	University of Maryland College Park
Oregon Health Sciences University	University of Massachusetts Amherst *
Oregon State University	University of Massachusetts Medical School Worcester
Pennsylvania State University	University of Medicine and Dentistry of New Jersey
Princeton University	University of Miami
Purdue University	University of Michigan Ann Arbor
Rice University *	University of Minnesota Twin Cities
Rockefeller University	University of Mississippi *
Rutgers, The State University of New Jersey	University of Mississippi Medical Center *

University of Missouri Columbia  
University of Missouri Rolla \*  
University of Missouri St. Louis \*  
University of Montana \*  
University of Nebraska Lincoln \*  
University of Nevada Las Vegas \*  
University of Nevada Reno \*  
University of New Hampshire \*  
University of New Mexico  
University of North Carolina Chapel Hill  
University of North Carolina Greensboro \*

University of North Texas \*  
University of Notre Dame \*  
University of Oklahoma Health Sciences Center \*  
University of Pennsylvania  
University of Pittsburgh  
University of Rhode Island \*  
University of Rochester  
University of South Carolina Columbia \*  
University of South Florida  
University of Southern California  
University of Southern Mississippi \*  
University of Tennessee Knoxville \*  
University of Texas at Austin  
University of Texas Health Sci. Center San Antonio  
University of Texas Health Science Center Houston  
University of Texas MD Anderson Cancer Center  
University of Texas Medical Branch Galveston  
University of Texas SW Medical Center Dallas  
University of Utah  
University of Vermont  
University of Virginia  
University of Washington  
University of Wisconsin Madison  
University of Wisconsin Stevens Point \*  
University of Wyoming \*  
Vanderbilt University  
Virginia Commonwealth University  
Virginia Polytechnic Institute and State University  
Wake Forest University  
Washington State University \*  
Washington University  
Wayne State University  
West Virginia University \*  
Woods Hole Oceanographic Institute  
Yale University  
Yeshiva University New York

<sup>1</sup>Based on data from the table *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 fiscal year 2000* of *Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions* (National Science Foundation, accessible through the Internet at: <http://www.nsf.gov/sbe/srs/nsf03326> ).

\*Annotated institutions are not in the list for the most successful Federally funded, but were among the top 50<sup>th</sup> percentile of those funded by the National Research Initiative (Competitive, Special, and Facilities Research Grant Act (7 U.S.C. 450i(b)) over the past three years (fiscal years 1999 through 2001).

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## NRI DEADLINE DATES FOR FY 2004

The following fixed dates have been established for FY 2004 application submission deadlines within the National Research Initiative Competitive Grants Program, Cooperative State Research, Education, and Extension Service, United States Department of Agriculture. To be considered for funding in any fiscal year, applications **must be RECEIVED BY Close of Business (5:00 P.M., Eastern Time)** on the date listed below. When the deadline date falls on a weekend or Federal holiday, transmission must be made by the following business day.

**Programs offered in any fiscal year depend on availability of funds and deadlines may be delayed due to unforeseen circumstances.** Consult the pertinent NRI notice in the *Federal Register*, the *NRI Request for applications*, or the NRI home page (<http://www.reeusda.gov/nri>) for up-to-date information.

Receipt Dates (by COB)	Program Codes	Program Areas
January 9	26.0	Watershed Processes and Water Resources
	41.0	Animal Reproduction
	44.0	Animal Protection
	51.2	Integrative Biology of Arthropods and Nematodes
	52.1	Plant Genome, Bioinformatics, and Genetic Resources
	52.2	Genetic Processes and Mechanisms of Crop Plants
	71.2	Biobased Products and Bioenergy Production Research
January 23	22.1	Plants and Environmental Adaptation
	31.0	Improving Human Nutrition for Optimal Health
	51.9	Biology of Weedy and Invasive Plants
	61.0	Markets and Trade
	62.0	Rural Development
	71.1	Improving Food Quality
February 18	25.0	Soils and Soil Biology
	51.3	Arthropod and Nematode Gateways to Genomics
	51.8	Biology of Plant-Microbe Associations
	53.0	Developmental Processes of Crop Plants
	54.3	Biochemistry of Plants and Plant Symbionts
	73.0	Improved Utilization of Wood
March 16	23.1	Managed Ecosystems
	32.0	Food Safety
	32.1	Epidemiological Approaches for Food Safety
	32.2	Food Safety Organized Research Unit (FS-CAP)
	42.0	Animal Growth and Nutrient Utilization
	52.4	Applied Plant Genomics CAP
	75.0	Nanoscale Science and Engineering
June 15	20.0	Biosecurity
	28.0	Air Quality
	31.5	Human Nutrition and Obesity
	43.0	Animal Genomics
	43.1	Animal Genome Reagents and Tool Development
	45.0	Functional Genomics

## CHECKLIST

All applications submitted under the NRI must contain the applicable elements outlined in these guidelines. The following checklist has been prepared to assist in ensuring that the application is complete and in the proper order prior to mailing:

- Proposal Cover Page (Form CSREES-2002)**
  - Have all blocks been completed?
  - Have all Project Directors and the Authorized Organizational Representative (when required) signed the form?
  - Does one copy contain pen-and-ink signatures?
  - Have you included a telephone number where a message may be left for you?
- Table of Contents**
  - Are page numbers included for each item?
- Project Summary (Form CSREES-2003)**
  - Has the Project Summary been included on the form?
  - Do the name and institution of all Project Directors appear on the form, or on the following page?
  - Does the Project Summary include research, education, and/or extension objectives, as appropriate?
  - Has an issue area been identified in the Project Summary?
  - If an integrated project is being proposed, is this indicated in the Project Summary?
  - Does the Project Summary fit within the designated box on the form?
  - Has the appropriate "Proposal Type" box been checked?
- Response to Previous Review** (for resubmissions)
  - Has the application been clearly and meaningfully revised and are the revisions briefly described?
  - Are comments from the previous review addressed?
- Project Description**
  - Is the project fully described?
  - If a renewal application, is a clearly marked progress report included?
  - Does this section adhere to the format and page limitations?
  - Does this section begin as page 1, as specified?
- References to Project Description**
  - Are all references cited?
  - Are all citations referenced?
  - Do all citations contain a title, the names of all authors, and are they in accepted journal format?
- Facilities and Equipment**
  - Have you given a description of your facilities and equipment, sufficient to indicate that you will be able to carry out this project?
- Key Personnel** (Vitae and Publication Lists)
  - Are vitae included for all Project Directors, collaborators, and other senior personnel?
  - Is the publication list complete and limited to the last four years?
- Documentation from Collaborator(s), Scientific Mentor, or Host Institution** (where appropriate)
- Conflict of Interest List (Form CSREES-2007)**
  - Has a list been completed for each person who must submit a C.V.? Does the list include the four categories as appropriate?
- Results from Prior NRI Support** (if appropriate)
- Budget (Form CSREES-2004)**
  - Are annual and summary budgets included?
- Budget Narrative**
  - Are budget items individually justified?
- Matching** (if required)
- Current and Pending Support (Form CSREES-2005)**
  - Have all current and pending projects been listed and summarized, **including this one**, for each Project Director listed on the Proposal Cover Page (Form CSREES-2002)?
- Assurance Statement (Form CSREES-2008, where applicable)**
  - Has the project been approved by necessary Institutional Review Board(s)?
  - Has the form been signed by the Authorized Organizational Representative (where required)?
- NEPA (Form CSREES-2006)**
  - Has the NEPA form been completed and included?
- Appendices to Project Description**
  - Are they limited to 2 (as described in the instructions)?
- General**
  - Have you included the Personal Data on Project Director(s) (Page B of Form CSREES-2002) **only** on the original application?
  - Have you contacted the appropriate National Program Leader if you have questions about the suitability of the proposed work?
  - Does the application conform to all format and page limitations and deadline requirements?
  - Is there an original and 14 copies (except for applications for Research Career Enhancement Awards (Sabbatical Awards), Equipment Grants, and Seed Grants, which require an original and 10 copies) of the application?
  - Are all copies complete?